Miller
The Power of Blue.

OM-172 324D
September1998

Processes

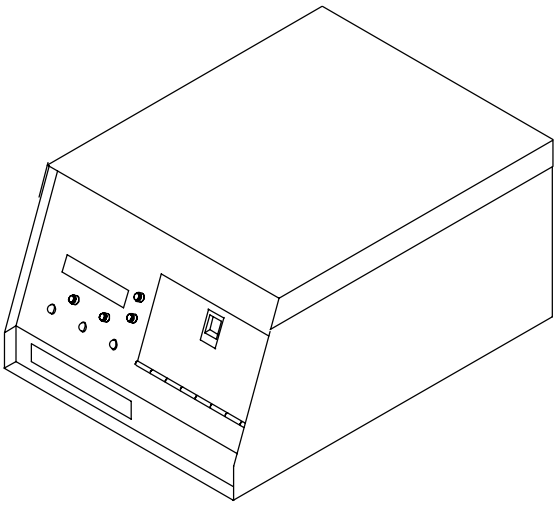
MIG (GMAW) Welding
Pulsed MIG (GMAW-P)

Automatic Welding

Description

Automatic Welding Interface

Robotic Interface II

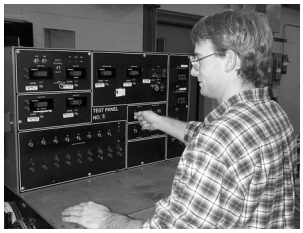


OWNER'S MANUAL

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.



That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller
The Power of Blue.

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OPTIONS AND ACCESSORIES

WARRANTY

ROBOTIC INTERFACE II SET-UP INFORMATION

Please fill out the following information when setting up your equipment. It can be used for your records and also be valuable if you ever need to call for service.

Model: ROBOTIC INTERFACE II, Serial Number: _____

Software Version _____

SET-UP INFORMATION (found in set-up menu)

Range: min V _____
max V _____
min A _____
max A _____

Shutdown: ☐ off ☐ on
Program Remote Select: ☐ off ☐ on

Security: ☐ off ☐ on

Stick Check: ☐ off ☐ on

Access: ☐ off ☐ on

Jog IPM: _____

Mig Type: dvc ☐ off ☐ on

Robot: ☐ total control ☐ power source, wire gas, and analog
☐ Arc on and analog
☐ Arc on and no analog

Inductance: _____

Monitor Arc Voltage Error: ☐ off ☐ on
Range _____
Seconds _____

Purge: _____

Voltage: ☐ 17 pin ☐ Vsense

Arc Start: ☐ standard ☐ hot

Arc Time: _____

Wire Feed: ☐ ipm ☐ mpm

Wire Type: ☐ hardwire ☐ softwire

Display: ☐ actual ☐ amps
☐ command

OTHER IMPORTANT INFORMATION

Wire Size: _____ Type: _____ Gas: _____

Program#: _____ ☐ factory ☐ custom

Mig or Pulse: Wire Speed: _____ Voltage/Trim: _____ Travel Speed: _____

Weld Cable Size: _____ Approx. Length: _____

Material Type: _____ Thickness: _____ Type of Joint: _____

Declaration of Incorporation for European Community (CE) Products

Manufacturer's Name: Miller Electric Mfg. Co.

Manufacturer's Address: 1635 W. Spencer Street
Appleton, WI 54914 USA

Declares that the product: **Robotic Interface II**

conforms to the following Directives and Standards:

Directives

Electromagnetic Compatibility Directives: 89/336/EEC, 92/31/EEC

Low Voltage Directive: 73/23/EEC

Machinery Directives: 89/392/EEC, 91/368/EEC, 93/C 133/04, 93/68/EEC

Standards

Safety Requirements for Arc Welding Equipment Part 1: EN 60974-1: 1990

Arc Welding Equipment Part 1: Welding Power Sources: IEC 974-1 (April 1995 – Draft revision)

Degrees of Protection provided by Enclosures (IP code): IEC 529: 1989

Insulation coordination for equipment within low-voltage systems: Part 1: Principles, requirements and tests: IEC 664-1: 1992

Electromagnetic compatibility (EMC) Product standard for arc welding equipment: EN50199: August 1995

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Milanese, Italy

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Fax: 39(02)98290-203

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

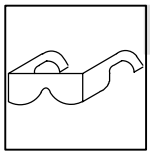
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.

MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

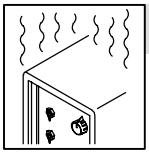
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

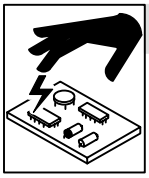
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

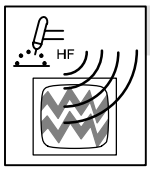
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

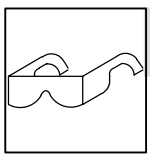
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

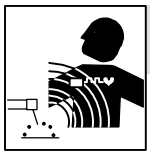
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

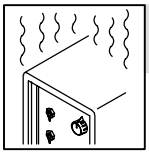
1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

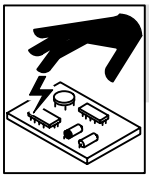
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

DES ORGANES MOBILES peuvent provoquer des blessures.

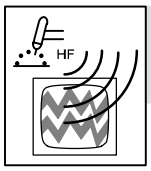
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

SECTION 2 – INSTALLATION

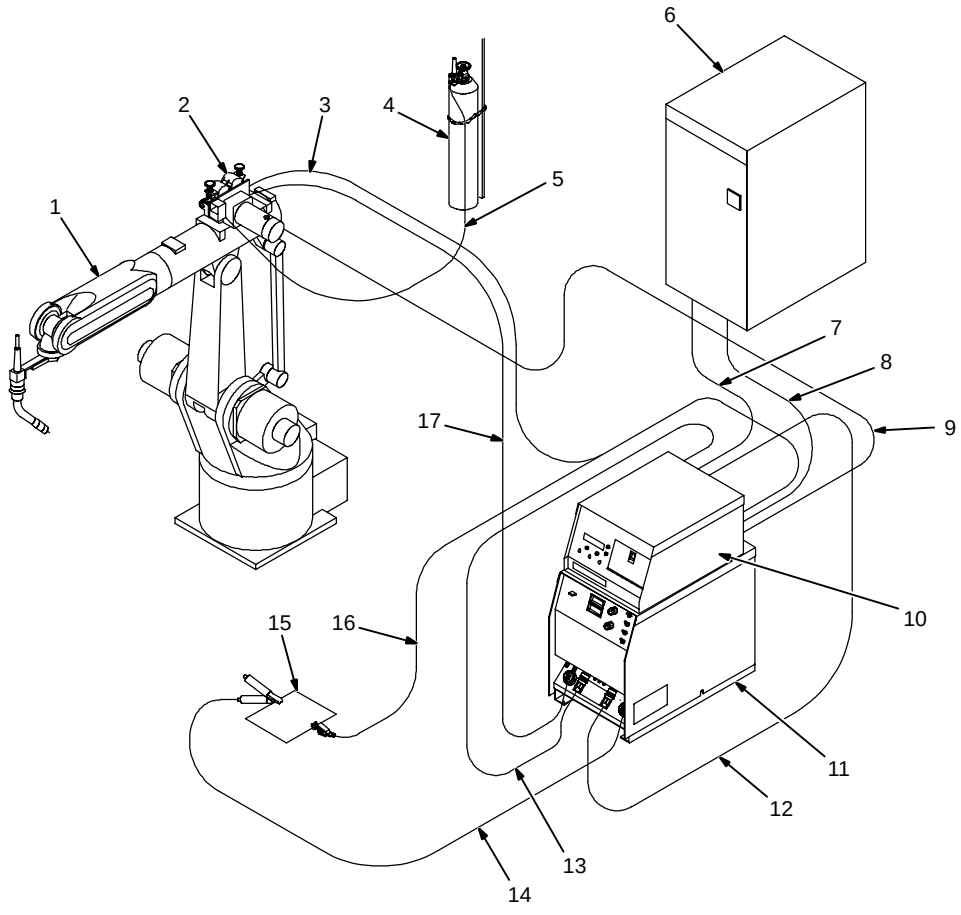
2-1. Specifications

Specification	Description
Type Of Input Power From Welding Power Source	Single-Phase 115 Volts AC, 5 Amperes, 50/60 Hertz
Welding Power Source Type	Constant Voltage (CV) DC, With Contactor And 14-Pin Remote Control For GMAW Welding Constant Voltage (CV)/Constant Current (CC) DC Inverter, With Contactor And 14-Pin Remote Control For GMAW-P Welding
Wire Feed Speed Range*	Standard: 50 To 780 ipm (1.3 To 19.8 mpm)
Wire Diameter Range	.030 To .062 in (0.8 To 1.6 mm)
Welding Processes	Gas Metal Arc (GMAW), Gas Metal Arc - Pulse (GMAW-P), Flux Cored Arc (FCAW), And Submerged Arc Welding (SAW)
Overall Dimensions	Length: 21-3/4 in (552 mm); Width: 15-1/4 in (387 mm); Height: 10 in (254 mm)
Weight	Ship: 75 lb (34 kg)

*These are the wire feed speed ranges while GMAW welding. While Pulse welding, the wire feed speed ranges may be more limited (see Section 6).

2-2. Connection Diagram

☞ *The proper interface kit must be installed in the interface unit to allow it to be connected to the robot.*



1 Robot (Will Vary According To Application)
2 Motor/Drive Assembly
3 Positive (+) Voltage Sensing Lead
4 Gas Cylinder
5 Gas Hose
6 Robot Control
7 Robot Input/Output Cable
8 Remote Program Select Cable (Optional)
9 Gas And Motor Control Cable
10 Interface Unit
11 Welding Power Source
12 17-Socket Plug And Interconnecting Cord
13 14-Socket Plug And Interconnecting Cord
14 Negative (–) Weld Cable
15 Workpiece
16 Negative (–) Voltage Sensing Lead
17 Positive (+) Weld Cable

☞ *Adapter cord 043551 must be ordered when using an inverter power source equipped with only a 14-socket receptacle.*

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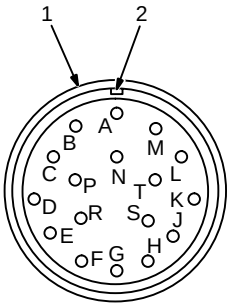
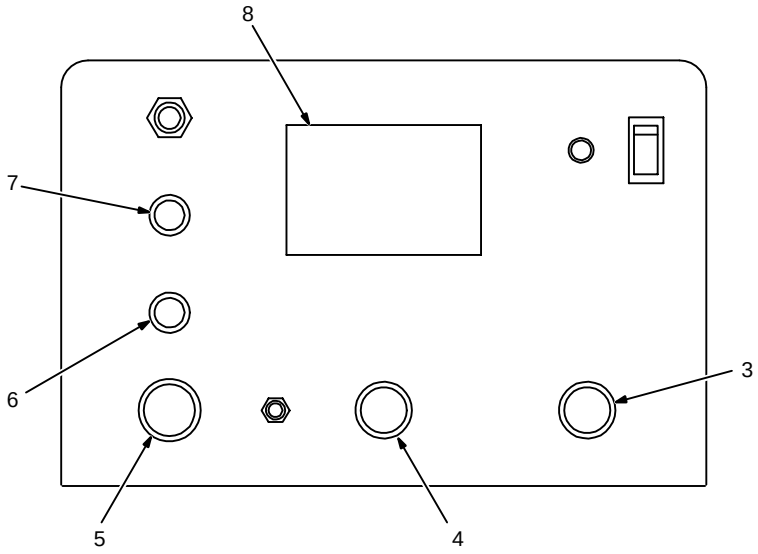
2-3. Rear Panel Connections



Example Receptacle



☞ *If optional external voltage sensing connections are used, remove jumper link from across terminals D and E on internal terminal strip 2T and install jumper link across terminals C and D. See Section 2-4 for the location of 2T.*

1 Receptacle

2 Keyway

3 14-Pin Receptacle (Connection To Welding Power Source)

4 17-Pin Receptacle (Connection To Welding Power Source With 17-Pin Receptacle)

5 19-Socket Receptacle (Motor/Shielding Gas Control Connection To Motor Drive Assembly)

6 10-Socket Receptacle (Optional Remote Program Select Connection To Robot Control)

To connect matching interconnecting cord to one of the above receptacles, align keyway, insert plug, and tighten threaded collar. Connect remaining end of cord to matching receptacle on applicable equipment (see Section 2-2).

7 4-Pin Receptacle (Optional External Voltage Sensing Connection)

To connect interconnecting cord to receptacle, align keyway, insert plug, and tighten threaded collar.

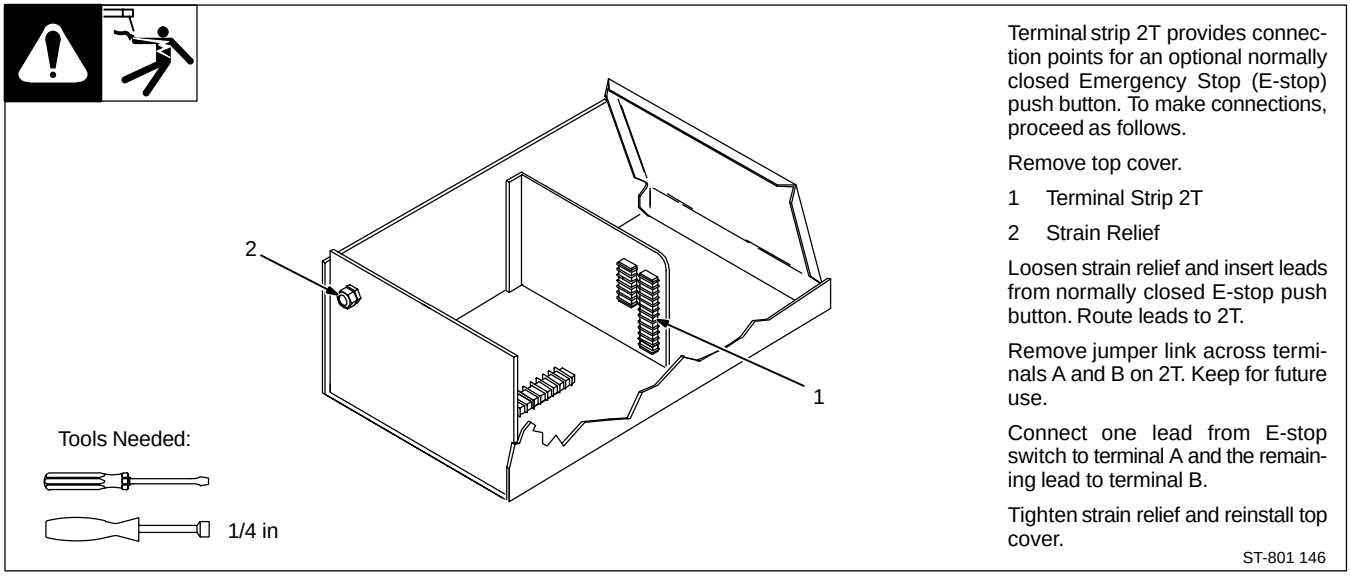
Cord for voltage sensing connection divides in two. Secure ring terminal on one cord to clamp and attach clamp to work. Secure ring terminal on remaining cord to motor/drive assembly where weld cable is connected.

8 Interface Panel (Robot Control Connection)

Receptacle will vary according to the robot control being used with the system. Follow connection directions included with interface panel kit.

Ref. S-0003-A / ST-800 962-A

2-4. Connecting Optional Emergency Stop Push Button



Terminal strip 2T provides connection points for an optional normally closed Emergency Stop (E-stop) push button. To make connections, proceed as follows.

Remove top cover.

1 Terminal Strip 2T

2 Strain Relief

Loosen strain relief and insert leads from normally closed E-stop push button. Route leads to 2T.

Remove jumper link across terminals A and B on 2T. Keep for future use.

Connect one lead from E-stop switch to terminal A and the remaining lead to terminal B.

Tighten strain relief and reinstall top cover.

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SECTION 3 – OPERATIONAL TERMS

The following is a list of terms and their definitions as they apply to this interface unit:

General Terms:

Adaptive Pulse Welding	When the “adaptive pulse” welding process is selected, the unit will automatically regulate pulse frequency in order to maintain a constant arc length, regardless of change in welding wire stickout.
Abk (Background Amperage)	Abk is the low weld current. Background current preheats welding wire and maintains the arc. When background current is too low, the arc is unstable and hard to maintain.
Apk (Peak Amperage)	Apk is the high pulse of welding current. Peak current melts the welding wire and forms a droplet. The droplet is forced into the weld puddle.
Inductance	In short circuit GMAW welding, an increase in inductance will decrease the number of short circuit metal transfers per second (provided no other changes are made) and increase the arc-on time. The increased arc-on time makes the pool more fluid.
PPS (Pulses Per Second)	PPS, pulse rate, and frequency (Hz) are used interchangeably. A PPS or pulse rate of 60 Hz means 60 pulses of current are produced each second.
PWms (Pulse Width in Milliseconds)	PWms is the time spent at peak current (1.2 ms is .0012 seconds). This time must be long enough to form a droplet of welding wire. The stiffness or fluidity of the molten weld puddle is controlled by PWms.
Synergic	Synergic refers to the unit’s ability to use preprogrammed pulse parameters to determine the actual pulse settings of Peak Amperage, Background Amperage, Pulse Frequency and Pulse Width at any specific wire feed speed setting.
Trim	Term used to represent arc length adjustments in pulse programs. Increasing trim increases the actual arc length. Likewise, decreasing trim shortens arc length. Trim is replaced by volts in MIG programs.

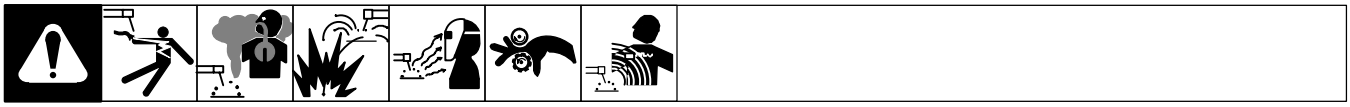
Pulse Panel Terms:

Card Mode	Is used to select use of the optional data card storage and retrieval capabilities.
Process Mode	Is used to select the type of process to be used, including Pulse, Adaptive Pulse, or Mig.
Sequence Mode	Is used to select and program the weld sequences which include preflow, run-in, weld, crater, burnback, and postflow.

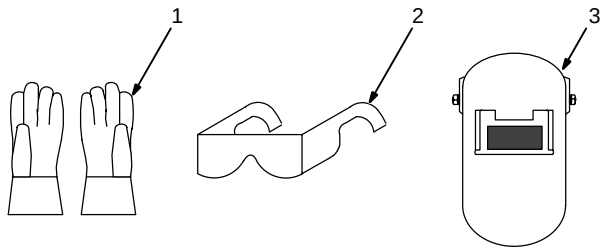
Setup Screen Terms:

Access Code	NOTE: The optional Data Card is required to activate this feature. With code off, access to the setup displays is not restricted. With code on, the operator must know and enter the access code to access or change any of the setup displays. To use code, press Parameter Select button to enter access code. When the correct letter is entered, the indicator automatically moves to the next character. When the final access code letter is entered, the display automatically changes to the initial setup display.
Arc Start	NOTE: Do not use the Hot Start setting for .035 in (9 mm) or smaller wire. Use the Hot Start mode for pulse welding with 450 Ampere Inverter Model when high initial weld current is necessary to start large diameter welding wires. When in Hot Start, the 450 Ampere Inverter Model starts the arc in the CV mode and switches to CC once the arc is started. Do not use Hot Start unless using 450 Ampere Inverter Model.
Arc Time	Allows actual arc time up to 9,999.99 hours and weld cycles up to 999,999 to be accumulated and displayed on the digital display, and can be reset to zero as required.
Mig Type (Voltage Correction)	With DVC Voltage Correction On, the unit uses closed-loop feedback from the 17-pin cord or voltage sensing leads to maintain set voltage parameters. With DVC Voltage Correction Off, feedback from the arc is not used for closed-loop feedback to maintain voltage parameters. Feedback from the arc is still used for other functions. Be sure voltage sensing leads are connected or voltage feedback is available through the 17-pin receptacle via the welding power source.
Name Feature	When using the optional Data Card and turning the name feature on, programs written to the card can be identified by name, number, job number, etc.
Program Reset	By selecting program reset in the memory reset mode, the unit defaults to original factory program settings for the program last active. All other program and setup information remains the same.
Range	The interface requires that the voltage and amperage range of the welding power source be entered. Obtain this information from the welding power source Owner's Manual.
Security	NOTE: The optional Data Card is required to activate this feature. Is used to limit what the operator can control. This includes accessing the number of the program, 1 through 8, and the range of welding parameters within the program.
Software Screen	Selection of this function will display the software version of the unit. When talking with factory service personnel, this number may be required.
System Reset	By selecting system reset in the memory reset mode, the unit defaults to original factory settings for all programs and all set up excluding System, Arc Time, and Model Type.
Voltage (Control Feedback)	Allows voltage to be monitored at the output terminals by two methods. This can be selected through the 17-pin cord connection if the welding power source has a 17-pin receptacle, or through the unit's external voltage sense lead. If the 17 Pin setting is used, it is recommended that the voltage sensing terminals on the welding power source be used to monitor arc voltage at the workpiece. When using the V. Sense setting, arc voltage feedback is through the voltage sense leads connected to the feeder. Use this setting when there is more than 50 ft (15 m) of weld cable used.
Arc Start/Volt Sense Shutdown	When this feature is on, the system immediately shuts down if no arc voltage is sensed. An error message is displayed. When this feature is off, wire feeds even when there is no arc voltage sensed.
Wire Feed Mode	Allows the selection of inches per minute or meters per minute for wire feed speed. This mode is also used to select motor type; standard speed, low speed, or high speed. High speed motor is available as factory option.

SECTION 4 – OPERATION



4-1. Safety Equipment



Wear the following while welding:

1 Dry, Insulating Gloves

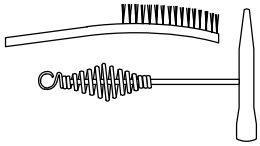
2 Safety Glasses With Side Shields

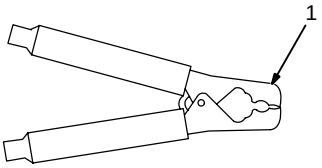
3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

sb3.1 1/94

4-2. Work Clamp

Tools Needed:





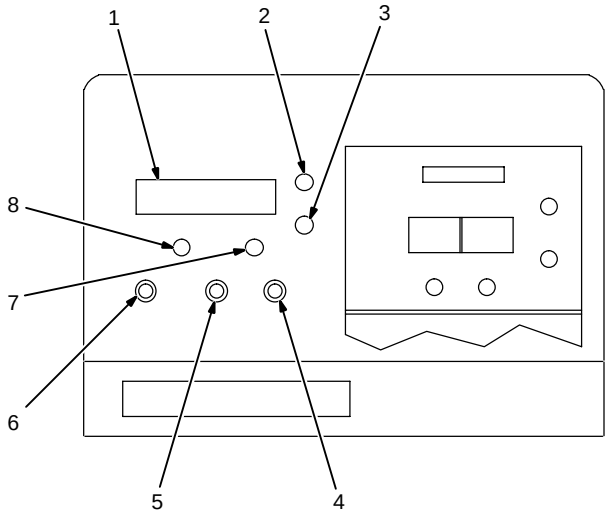
1 Work Clamp

Connect work clamp to a clean, paint-free location on workpiece, as close to weld area as possible.

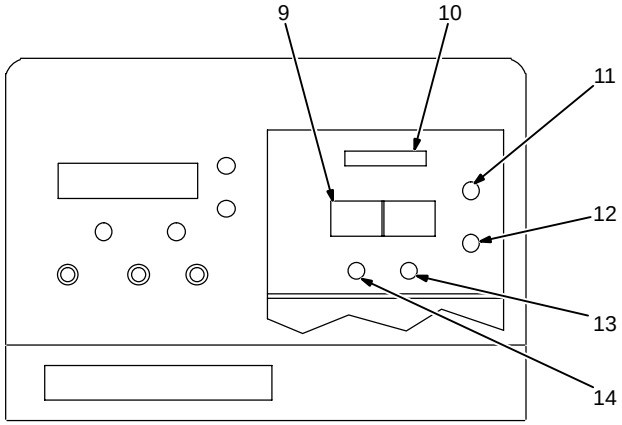
Use wire brush or sandpaper to clean metal at weld joint area. Use chipping hammer to remove slag after welding.

sb4.1* 2/93

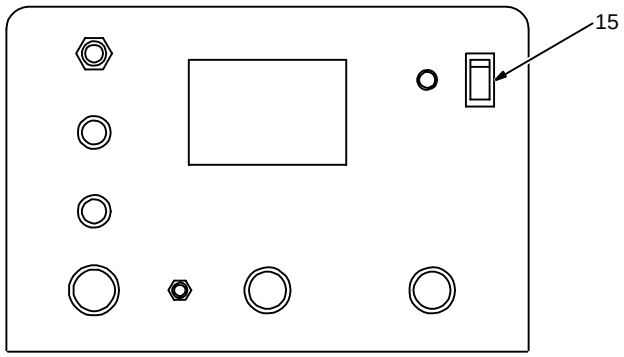
4-3. Controls



Front Panel



Pulse Panel



Rear Panel

Front Panel

1 Display

2 Reset Button

After clearing an error, press this button to reset the display.

3 Purge Button

Push to energize gas valve. If a purge time value is programmed, the gas will flow for the programmed length of time. If a value is not programmed, the gas flows until the Purge button is released.

This button allows purging of air from gun shielding gas line, and adjusting shielding gas regulator without energizing the welding circuit.

Front panel and pulse panel controls, and the gun trigger do not work when the Purge button is pressed.

4 Contactor On Light

Lights when welding power source contactor is energized.

5 Wirefeed On Light

Lights when wirefeed motor is On.

6 Gas On Light

Lights when gas flow is On.

7 Retract Button

Push to retract welding wire without energizing welding circuit or shielding gas valve.

8 Advance Button

Push to feed welding wire without energizing welding circuit or shielding gas valve.

Pulse Panel

9 Display

10 Data Card Slot

Insert optional data card here. See Section 9 for information on using the data card.

11 Increase Button

12 Decrease Button

13 Parameter Select Button

14 Mode Select Button

See Section 5 for information on using pulse panel controls.

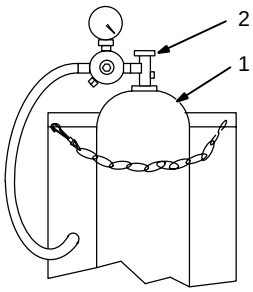
Rear Panel

15 Power Switch

User power switch to tun unit On and Off.

ST-800 755-B / ST-800 962-A

4-4. Shielding Gas



1 Shielding Gas Cylinder

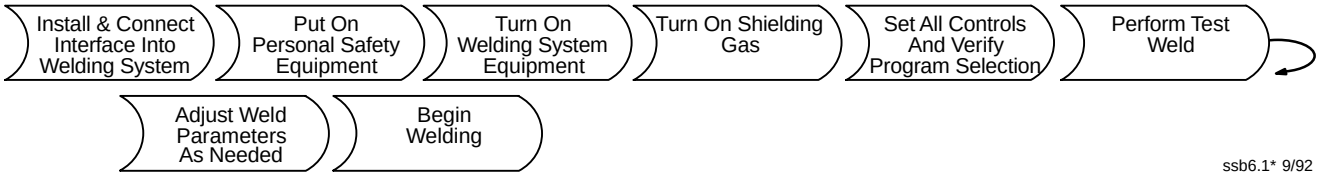
2 Valve

Open valve on cylinder just before welding.

Close valve on cylinder when finished welding.

sb5.1* 6/92 – S-0621-C

4-5. Sequence Of Gas Metal Arc (GMAW), Gas Metal Arc - Pulse (GMAW-P), And Flux Cored Arc Welding (FCAW)


Install & Connect Interface Into Welding System
Put On Personal Safety Equipment
Turn On Welding System Equipment
Turn On Shielding Gas
Set All Controls And Verify Program Selection
Perform Test Weld
Adjust Weld Parameters As Needed
Begin Welding

ssb6.1* 9/92

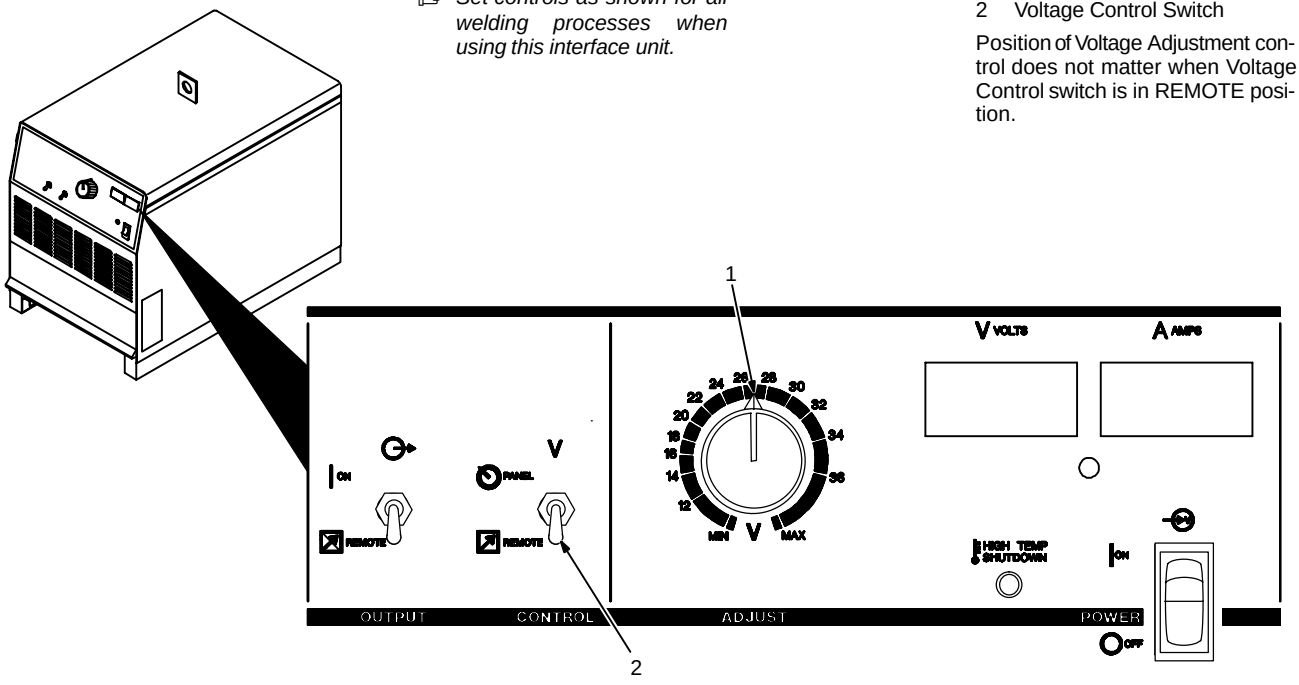
4-6. Control Settings On Deltaweld® 452/652 Ampere Model Welding Power Source

☞ *Set controls as shown for all welding processes when using this interface unit.*

1 Voltage Adjustment Control

2 Voltage Control Switch

Position of Voltage Adjustment control does not matter when Voltage Control switch is in REMOTE position.



ST-800 453 / Ref. ST-162 502-B

4-7. Control Settings On Dimension™ 452 Or 652 Ampere Model Welding Power Source

Dimension 452 Model

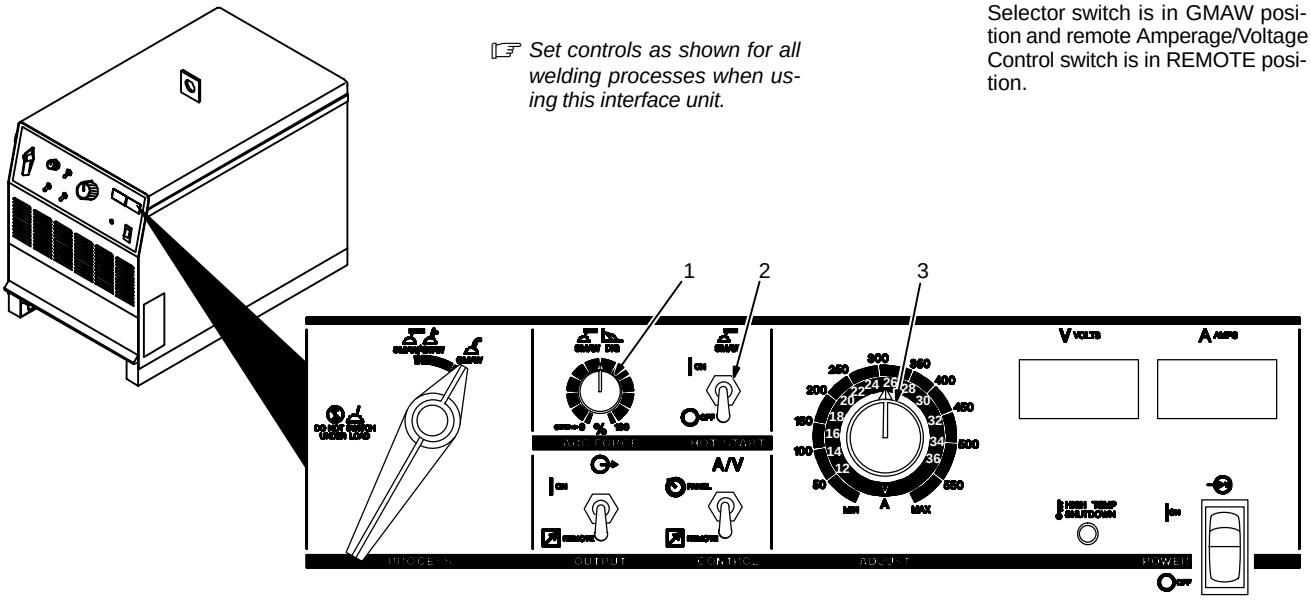
1 Arc Force (Dig) Control

2 Hot Start Switch

3 Amperage/Voltage Adjustment Control

Setting at controls and switch position does not matter when Process Selector switch is in GMAW position and remote Amperage/Voltage Control switch is in REMOTE position.

☞ *Set controls as shown for all welding processes when using this interface unit.*



ST-800 166-B / Ref. ST-161 964-A

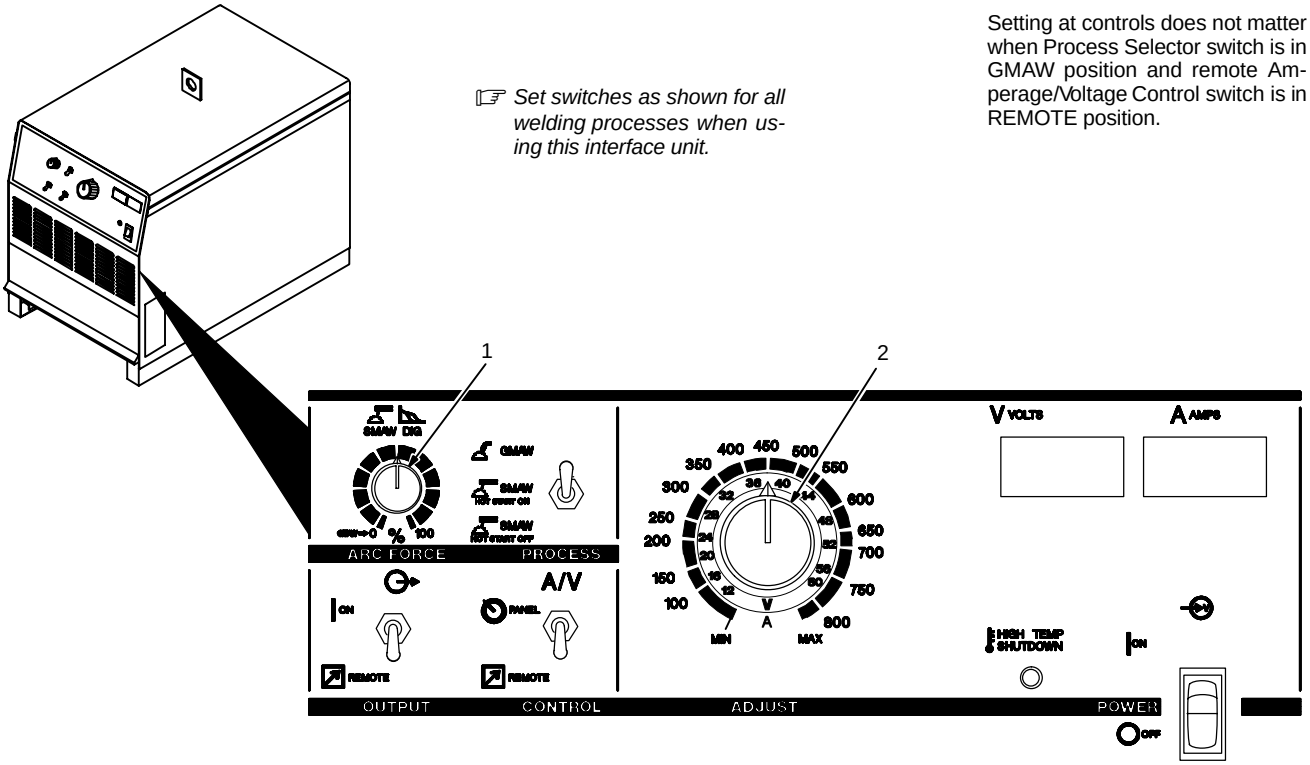
Dimension 652 Model

1 Arc Force (Dig) Control

2 Amperage/Voltage Adjustment Control

Setting at controls does not matter when Process Selector switch is in GMAW position and remote Amperage/Voltage Control switch is in REMOTE position.

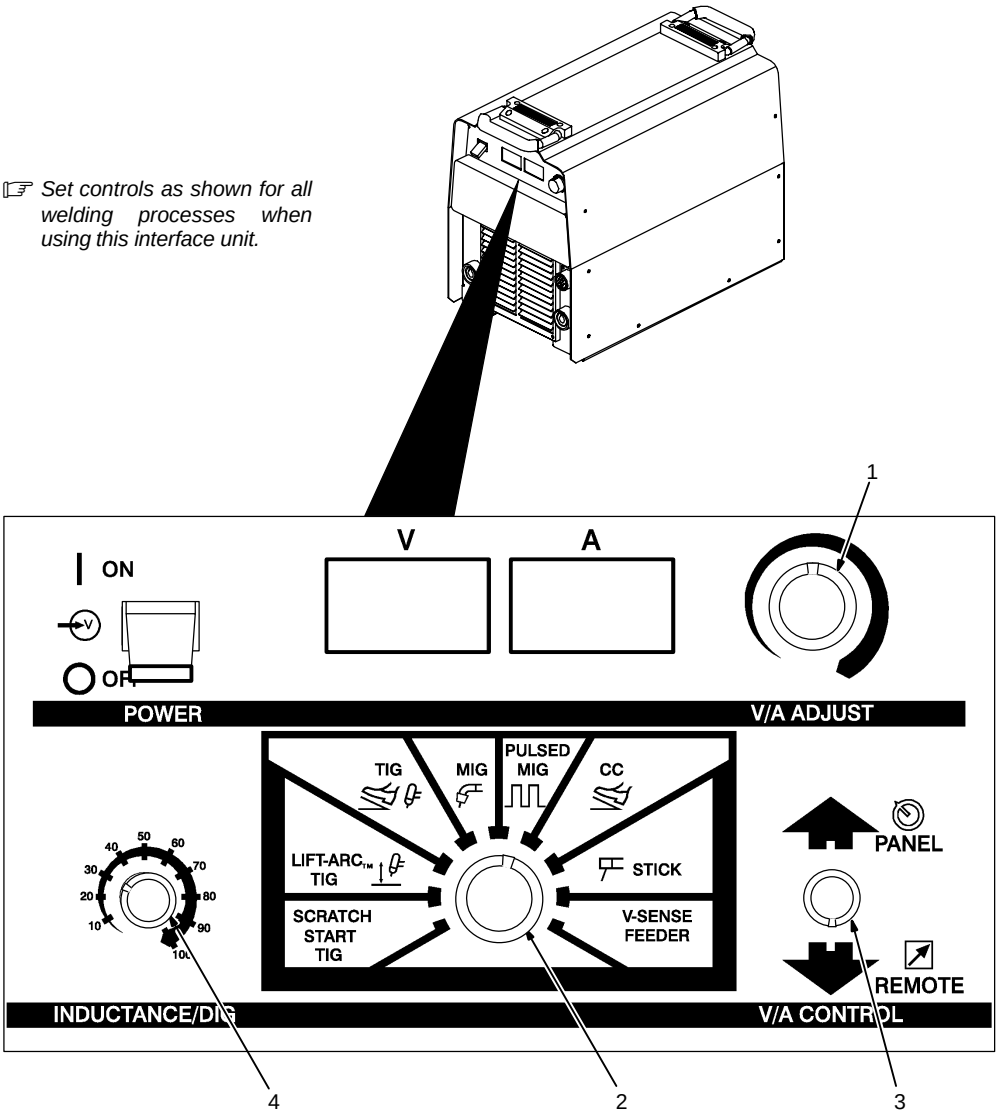
☞ *Set switches as shown for all welding processes when using this interface unit.*



ST-800 091 / ST-162 500-A

4-8. Control Settings On XMT® 304 Inverter Model Welding Power Source

☞ *Set controls as shown for all welding processes when using this interface unit.*



ST-801 192 / Ref. ST-175 086

1 Voltage/Amperage Adjustment Control

2 Mode Switch

The Mode switch setting determines both the process and output On/Off control. Source of control (panel or remote) for the amount of output is selected on the V/A Control switch.

☞ *Unit does not support remote MIG to PULSED MIG selection.*

3 Voltage/Amperage Control Switch

For front panel control, place switch in Panel position and use the V/A Adjust control.

For remote control, make connections to Remote 14 receptacle, and place switch in Remote position. Remote control is a percent of V/A Adjust control setting. Value selected on V/A Adjust is maximum available on remote.

4 Inductance/Dig Control

When set towards minimum, short-circuit amperage at low arc voltage is the same as normal welding amperage.

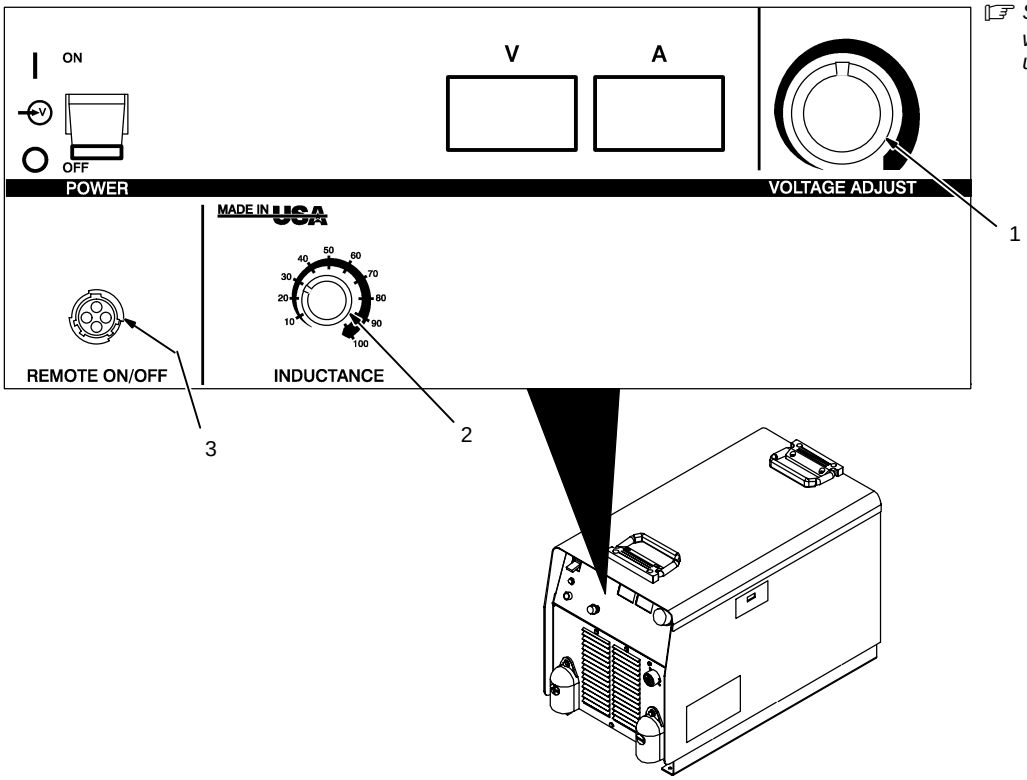
When set towards maximum, short-circuit amperage is increased at low arc voltage to assist with arc starts as well as reduce sticking while welding.

Select setting best suited for application.

Control adjusts inductance when a MIG (GMAW) position is selected on the mode switch. Inductance determines the “wetness” of the weld puddle. When set higher, “wetness” (puddle fluidity) increases.

☞ *Inductance is only used in MIG (nonpulsed) welding applications.*

4-9. Control Settings On Invision® 456P Inverter Model Welding Power Source



☞ *Set controls as shown for all welding processes when using this interface unit.*

ST-801 718 / ST-180 311-B

1 Voltage Adjustment Control

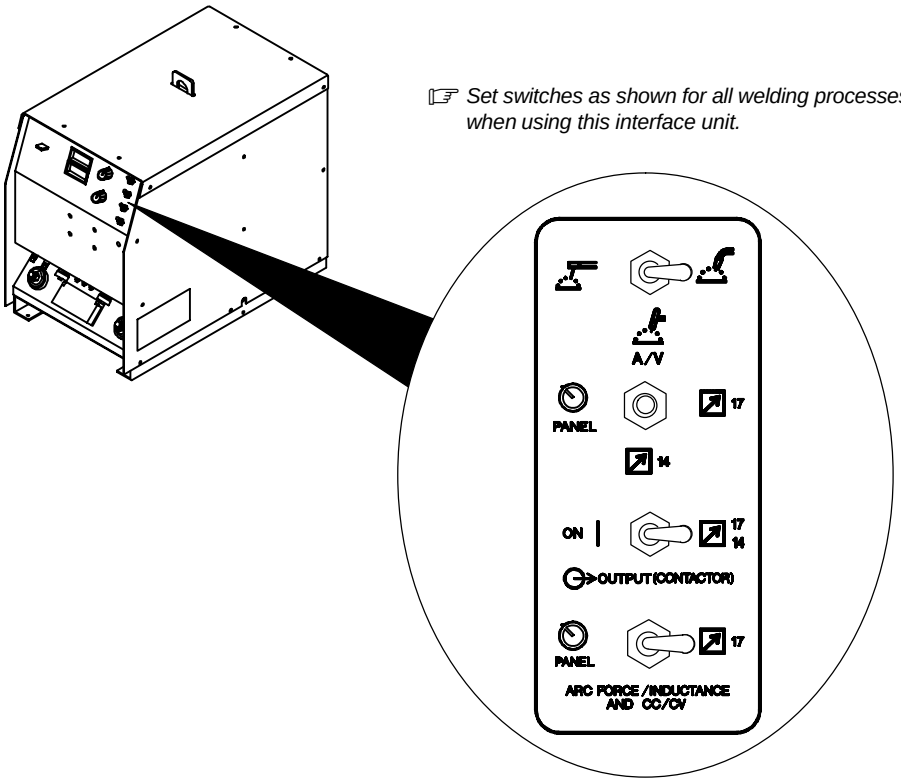
2 Inductance Control

Inductance determines the “wetness” of the weld puddle. When set higher, “wetness” (puddle fluidity) increases.

3 Remote On/Off Receptacle (Optional)

Sockets 1 and 2 are connected in parallel with the Power On/Off switch. For remote On/Off control, connect a suitable plug from a remote switch to the receptacle and place front panel Power On/Off switch in Off position. Unit can then be turned On and Off through the use of the remote switch.

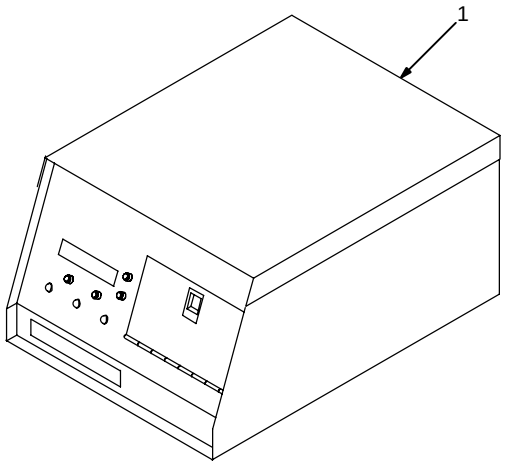
4-10. Setting Switches On Maxtron™ 450 Ampere Inverter Model Welding Power Source



Ref. ST-150 171-C / Ref. SC-154 197

SECTION 5 – INTRODUCTION TO PROGRAMMING

5-1. Interface Unit



1 Interface Unit

The interface unit is designed for use in pulse MIG welding (adaptive or standard), or MIG welding.

The unit is factory-equipped with eight programs for pulse MIG welding (see Section 5-2). The programs contain parameters that maximize welding performance for each combination of wire and shielding gas.

The unit also provides memory for the creation of up to eight MIG programs (see Section 8).

The weld programs require the user to enter information specific to the welding application. This information is entered as a part of program development (see Section 6 for pulsed MIG information), and during setup (see Section 10).

ST-801 077-A

5-2. Pulse MIG Programs

Program	Hardwire Selected*	Softwire Selected*
1	.035” Steel, Argon – Oxy	.045” 4043, Argon
2	.045” Steel, Argon – Oxy	.045” 5356, Argon
3	.035” Steel, Argon – CO2	.035” 4043, Argon
4	.045” Steel, Argon – CO2	.035” 5356, Argon
5	.035” 309, Argon – CO2	1/16” 4043, Argon
6	.045” Steel, 309, Argon – CO2	1/16” 5356, Argon
7	3/64” 5356, Argon	.045” Steel, Argon – CO2
8	.035” SIB, Argon	.045” Steel, Argon – Oxy

The eight pulse programs are shown in the table. Each program can be used in standard pulse MIG or adaptive pulse MIG.

In an adaptive pulse MIG program, the unit manipulates certain weld variables to hold arc voltage constant. This feature is described in Section 7-5.

The factory-set parameters for each program can be changed to customize them for an application (see Section 7).

☞ *Selecting hardwire or softwire is done during setup (see Section 10).*

5-3. Standard Pulse Welding Programs

The following sixteen (16) pulse welding programs are in the control memory. Use this information if it is necessary to change a standard program, or as a basis to build your own custom program. If at any time while changing a standard program, or while building your own custom program, you want to go back to the standard program in the control memory, see Section 10-15 for System memory Reset instructions. See Section 7 for explanation of Pulse welding settings.

Apk = Peak Amperage, Abk = Background Amperage, PPS = Pulses Per Second, PWms = Pulse Width (milliseconds).

Program 1 – .035 Steel, Argon-Oxy

Wire Size/Type: .035" Steel Gas: Ar - Oxy / 40 CFH					
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	460	90	210	2.4	
700 / 17.8	450	90	200	2.4	
650 / 16.5	440	85	190	2.3	
600 / 15.2	430	85	180	2.3	
550 / 14.0	420	80	170	2.3	
500 / 12.7	410	80	160	2.2	
450 / 11.4	400	75	150	2.2	
400 / 10.2	380	70	140	2.2	
350 / 8.9	360	65	130	2.1	
300 / 7.6	340	60	120	2.1	
250 / 6.4	320	55	110	2.0	
200 / 5.1	300	50	100	2.0	
150 / 3.8	280	45	80	1.9	
100 / 2.5	260	40	60	1.6	
50 / 1.3	230	35	40	1.5	

Program 2 – .045" Steel, Argon-Oxy

Wire Size/Type: .045" Steel Gas: Ar - Oxy / 40 CFH					
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	540	150	250	3.0	
700 / 17.8	530	150	240	3.0	
650 / 16.5	520	145	230	2.9	
600 / 15.2	510	135	220	2.9	
550 / 14.0	500	125	210	2.8	
500 / 12.7	490	115	200	2.8	
450 / 11.4	480	110	190	2.7	
400 / 10.2	470	105	175	2.7	
350 / 8.9	460	98	165	2.6	
300 / 7.6	450	95	150	2.6	
250 / 6.4	430	85	130	2.6	
200 / 5.1	410	75	110	2.5	
150 / 3.8	370	55	90	2.5	
100 / 2.5	330	40	70	2.4	
50 / 1.3	300	30	55	2.3	

Program 3 – .035 Steel, Argon-CO_2

Wire Size/Type: .035" Steel Gas: Ar - CO_2 / 40 CFH					
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	470	90	210	2.3	
700 / 17.8	470	90	210	2.3	
650 / 16.5	460	85	200	2.3	
600 / 15.2	450	85	190	2.2	
550 / 14.0	440	80	180	2.2	
500 / 12.7	430	80	170	2.2	
450 / 11.4	410	80	160	2.2	
400 / 10.2	390	75	150	2.1	
350 / 8.9	370	70	140	2.0	
300 / 7.6	350	70	120	2.0	
250 / 6.4	330	65	100	2.0	
200 / 5.1	310	55	80	2.0	
150 / 3.8	290	50	65	1.9	
100 / 2.5	270	40	50	1.7	
50 / 1.3	250	30	40	1.6	

Program 4 – .045" Steel, Argon - CO_2

Wire Size/Type: .045" Steel Gas: Ar - CO_2 / 40 CFH					
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	560	135	240	3.0	
700 / 17.8	560	130	235	3.0	
650 / 16.5	550	130	230	2.9	
600 / 15.2	540	125	225	2.9	
550 / 14.0	530	120	220	2.8	
500 / 12.7	520	115	210	2.8	
450 / 11.4	495	110	195	2.8	
400 / 10.2	480	100	180	2.8	
350 / 8.9	465	90	165	2.7	
300 / 7.6	450	85	150	2.6	
250 / 6.4	430	80	130	2.6	
200 / 5.1	410	70	110	2.5	
150 / 3.8	38270	55	90	2.5	
100 / 2.5	360	48	70	2.4	
50 / 1.3	360	48	70	2.4	

Program 5 – .035” ER 309, Argon - CO_2

Wire Size/Type: .035” ER 309	Gas: Ar - CO_2 / 40 CFH				
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	390	95	210	2.2	
700 / 17.8	380	95	200	2.1	
650 / 16.5	370	90	190	2.0	
600 / 15.2	360	85	180	1.9	
550 / 14.0	350	80	170	1.9	
500 / 12.7	340	75	160	1.9	
450 / 11.4	330	70	150	1.8	
400 / 10.2	320	65	140	1.8	
350 / 8.9	310	60	130	1.7	
300 / 7.6	300	55	120	1.7	
250 / 6.4	290	50	100	1.6	
200 / 5.1	280	45	80	1.6	
150 / 3.8	270	40	60	1.6	
100 / 2.5	270	36	40	1.5	
50 / 1.3	260	30	30	1.5	

Program 6 – .045” ER 309, Argon - CO_2

Wire Size/Type: .045” ER 309	Gas: Ar - CO_2 / 40 CFH				
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	490	110	260	2.3	
700 / 17.8	480	110	260	2.3	
650 / 16.5	470	105	260	2.2	
600 / 15.2	460	100	240	2.1	
550 / 14.0	450	100	240	2.0	
500 / 12.7	440	95	220	1.9	
450 / 11.4	430	95	200	1.9	
400 / 10.2	420	95	180	1.9	
350 / 8.9	410	95	160	1.8	
300 / 7.6	400	90	140	1.8	
250 / 6.4	380	85	120	1.8	
200 / 5.1	360	80	100	1.7	
150 / 3.8	340	70	80	1.6	
100 / 2.5	320	50	60	1.6	
50 / 1.3	320	45	45	1.6	

Program 7 – 3/64” ER 5356, Argon

Wire Size/Type: 3/64” ER 5356		Gas: Argon / 40 CFH			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	540	130	190	2.9	
700 / 17.8	520	125	190	2.8	
650 / 16.5	500	120	180	2.8	
600 / 15.2	480	115	170	2.8	
550 / 14.0	460	110	160	2.7	
500 / 12.7	440	100	150	2.7	
450 / 11.4	420	90	140	2.7	
400 / 10.2	390	85	130	2.6	
350 / 8.9	370	70	120	2.4	
300 / 7.6	355	55	110	2.3	
250 / 6.4	335	45	100	2.2	
200 / 5.1	310	35	90	2.2	
150 / 3.8	272	33	90	2.0	
100 / 2.5	262	24	60	2.0	
50 / 1.3	230	18	40	1.8	

Program 8 – .035” SIB, Argon

Wire Size/Type: .035” SIB		Gas: Argon / 40 CFH			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	375	160	270	1.8	
700 / 17.8	375	150	260	1.8	
650 / 16.5	375	140	245	1.8	
600 / 15.2	375	130	230	1.7	
550 / 14.0	375	120	210	1.7	
500 / 12.7	375	110	200	1.6	
450 / 11.4	375	100	185	1.5	
400 / 10.2	375	90	163	1.5	
350 / 8.9	360	82	145	1.5	
300 / 7.6	345	80	134	1.4	
250 / 6.4	330	60	124	1.4	
200 / 5.1	315	50	100	1.4	
150 / 3.8	300	44	90	1.3	
100 / 2.5	283	37	78	1.2	
50 / 1.3	265	30	65	1.2	

NOTE ☞ *The next 8 programs are available after changing software wiretype (see Section 10-13).*

Program 1 – .035” ER 4043, Argon

Wire Size/Type: .035” ER 4043		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	450	140	155	2.0	
730 / 18.5	445	135	150	1.9	
720 / 18.3	440	130	145	1.9	
710 / 18.0	430	130	140	1.8	
655 / 16.6	415	120	135	1.7	
600 / 15.2	400	118	125	1.7	
545 / 13.8	395	115	115	1.6	
490 / 12.4	370	100	105	1.5	
435 / 11.0	350	90	100	1.4	
380 / 9.7	320	78	95	1.3	
325 / 8.3	285	72	80	1.2	
270 / 6.9	265	60	75	1.1	
215 / 5.5	245	48	70	1.1	
160 / 4.1	205	41	49	1.0	
140 / 3.6	200	38	46	1.0	

Program 2 – 3/64” ER 4043, Argon

Wire Size/Type: 3/64” ER 4043		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	530	170	270	3.0	
740 / 18.8	515	168	265	3.0	
720 / 18.3	500	160	260	2.9	
710 / 18.0	480	155	252	2.8	
655 / 16.6	450	150	245	2.7	
600 / 15.2	420	143	240	2.6	
545 / 13.8	396	135	235	2.5	
490 / 12.4	372	128	230	2.4	
435 / 11.0	350	120	225	2.3	
380 / 9.7	325	114	205	2.2	
325 / 8.3	295	105	187	2.1	
270 / 6.9	275	87	160	2.0	
215 / 5.5	243	71	152	1.9	

160 / 4.1	212	55	125	1.9	
105 / 2.7	210	41	55	1.9	

Program 3 – 1/16” ER 4043, Argon

Wire Size/Type: 1/16” ER 4043		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
770 / 19.6	560	251	294	2.7	
730 / 18.5	560	251	294	2.7	
710 / 18.0	560	251	294	2.7	
655 / 16.6	560	251	294	2.7	
600 / 15.2	558	251	290	2.7	
545 / 13.8	540	251	275	2.6	
490 / 12.4	520	251	250	2.5	
435 / 11.0	495	251	225	2.4	
380 / 9.7	470	251	190	2.2	
325 / 8.3	455	240	150	2.0	
270 / 6.9	420	218	112	1.8	
215 / 5.5	380	168	90	1.7	
160 / 4.1	340	115	80	1.6	
105 / 2.7	295	73	55	1.5	
70 / 1.8	290	45	50	1.5	

Program 4 – .035” ER 5356, Argon

Wire Size/Type: .035” ER 5356		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
760 / 19.1	300	118	140	3.6	
740 / 18.8	295	114	145	3.5	
720 / 18.3	290	110	140	3.4	
710 / 18.0	286	103	128	3.3	
655 / 16.6	276	95	124	3.2	
600 / 15.2	268	86	115	3.2	
545 / 13.8	250	80	107	3.1	
490 / 12.4	238	78	105	3.0	
435 / 11.0	230	73	100	2.9	
380 / 9.7	215	65	90	2.8	
325 / 8.3	195	63	80	2.7	
270 / 6.9	180	58	70	2.5	
215 / 5.5	178	45	56	2.4	

160 / 4.1	175	33	45	2.3	
105 / 2.7	175	25	29	2.2	

Program 5 – 3/64” ER 5356, Argon

Wire Size/Type: 3/64” ER 5356		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
755 / 19.2	465	138	270	3.0	
730 / 18.5	445	130	265	2.9	
700 / 17.8	425	128	255	2.8	
680 / 17.3	405	120	245	2.7	
655 / 16.6	385	110	235	2.6	
600 / 15.2	365	100	228	2.5	
545 / 13.8	345	92	215	2.5	
490 / 12.4	330	85	200	2.4	
435 / 11.0	320	80	193	2.3	
380 / 9.7	310	78	186	2.2	
325 / 8.3	300	75	158	2.1	
270 / 6.9	272	65	130	2.0	
215 / 5.5	245	53	110	1.9	
160 / 4.1	236	47	67	1.8	
105 / 2.7	231	22	62	1.8	

Program 6 – 1/16” ER 5356, Argon

Wire Size/Type: 1/16” ER 5356		**Gas: Argon / 40 CFH**			
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
770 / 19.6	560	251	294	2.7	
735 / 18.7	560	251	294	2.7	
710 / 18.0	560	251	294	2.7	
655 / 16.6	545	251	294	2.7	
600 / 15.2	515	251	270	2.6	
545 / 13.8	480	251	224	2.5	
490 / 12.4	447	251	175	2.3	
435 / 11.0	427	240	155	2.1	
380 / 9.7	407	220	140	2.0	
325 / 8.3	387	190	126	1.9	
270 / 6.9	367	160	112	1.8	
215 / 5.5	354	124	92	1.7	
160 / 4.1	328	95	68	1.6	

105 / 2.7	315	51	58	1.6	
75 / 1.9	311	35	58	1.5	

Program 7 – 3/64” ER 5356, Argon

Wire Size/Type: 3/64” ER 5356	Gas: Argon / 40 CFH				
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
750 / 19.1	465	138	270	3.0	
720 / 18.3	445	130	265	2.9	
700 / 17.8	425	125	255	2.8	
680 / 17.3	402	120	244	2.7	
655 / 16.6	382	110	235	2.6	
600 / 15.2	360	99	225	2.5	
545 / 13.8	340	92	215	2.5	
490 / 12.4	325	85	200	2.4	
435 / 11.0	315	80	177	2.3	
380 / 9.7	305	76	168	2.2	
325 / 8.3	290	60	145	2.1	
270 / 6.9	270	55	125	2.0	
215 / 5.5	247	50	100	1.9	
160 / 4.1	225	41	68	1.8	
105 / 2.7	225	19	58	1.8	

Program 8 – .035” ER 5356, Argon

Wire Size/Type: .035” ER 5356	Gas: Argon / 40 CFH				
IPM / MPM	**Apk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
770 / 19.6	300	120	150	3.6	
740 / 18.8	295	114	145	3.5	
720 / 18.3	290	110	140	3.4	
710 / 18.0	286	103	133	3.3	
655 / 16.6	275	93	124	3.2	
600 / 15.2	267	85	117	3.2	
545 / 13.8	250	80	107	3.1	
490 / 12.4	235	78	100	3.0	
435 / 11.0	222	71	90	2.9	
380 / 9.7	207	65	83	2.8	
325 / 8.3	190	64	72	2.6	
270 / 6.9	185	52	65	2.4	
215 / 5.5	182	40	58	2.2	

160 / 4.1	180	30	43	2.1	
105 / 2.7	180	23	30	2.0	

5-4. Pulse Panel Mode Select Button

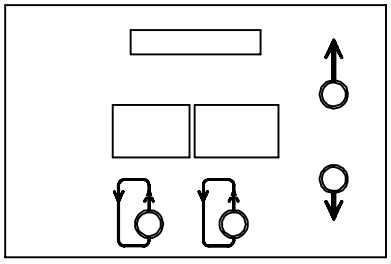
▲ Control circuit and interface operational power are On when using or changing the microprocessor settings.

1 Mode Display

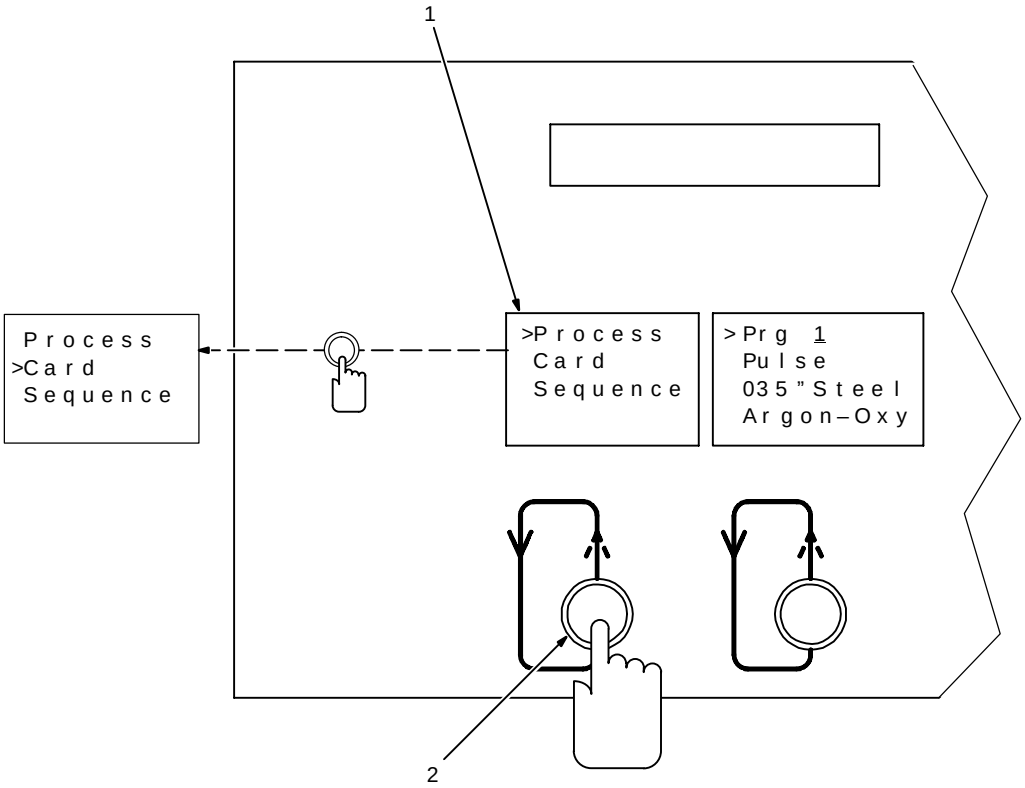
2 Mode Select Button

Press Mode Select button to move indicator in left window display.

Go to Section 5-5.



Pulse Panel



Ref. ST-154 109

5-5. Pulse Panel Parameter Select Button

▲ Control circuit and interface operational power are On when using or changing the microprocessor settings.

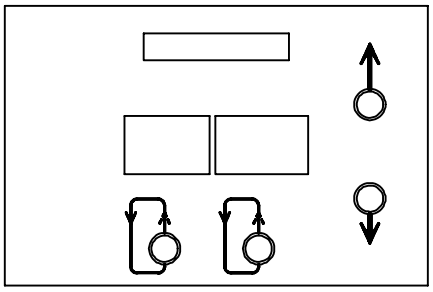
1 Parameter Display

2 Moving Line

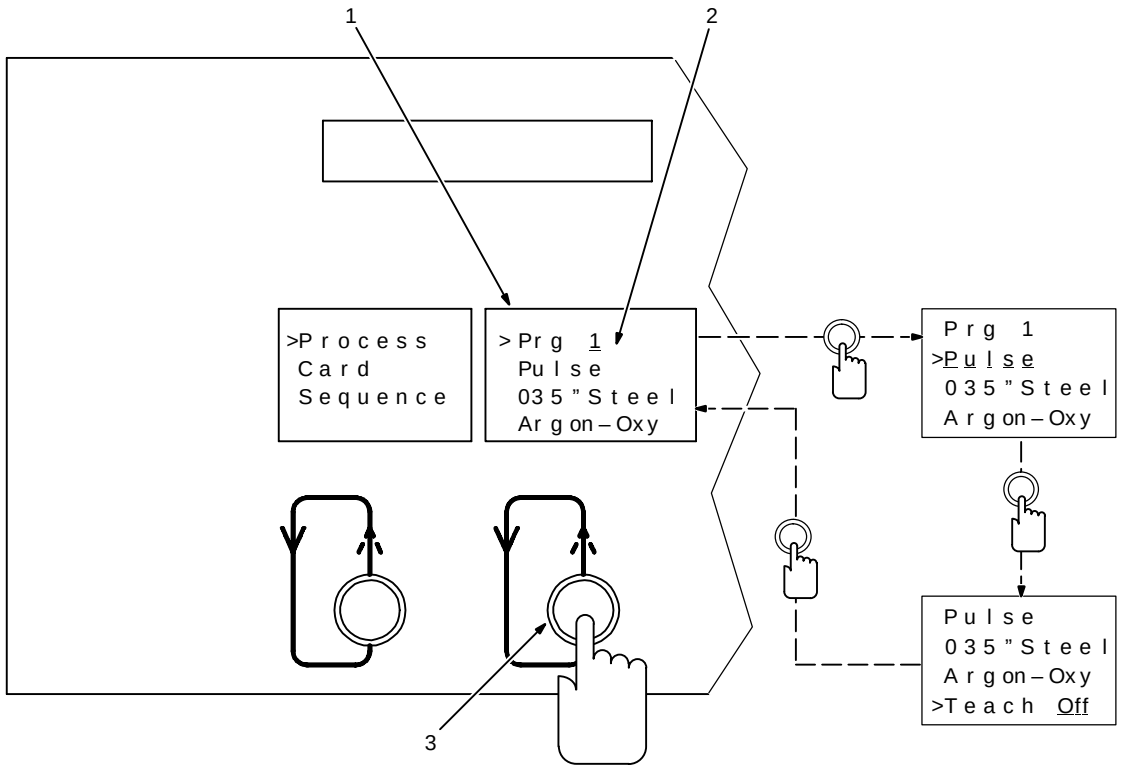
Moving line is under value that can be changed.

3 Pulse Panel Parameter Select Button

Press pulse panel parameter select button to move indicator in right window display.



Pulse Panel



Ref. ST-154 109

5-6. Pulse Panel Parameter Increase And Decrease Buttons

▲ Control circuit and interface operational power are On when using or changing the microprocessor settings.

Use mode select button to select mode to be changed (see Section 5-4).

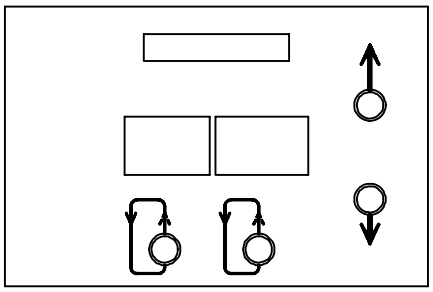
Use pulse panel parameter select button to select parameter to be changed (see Section 5-5).

1 Increase Button

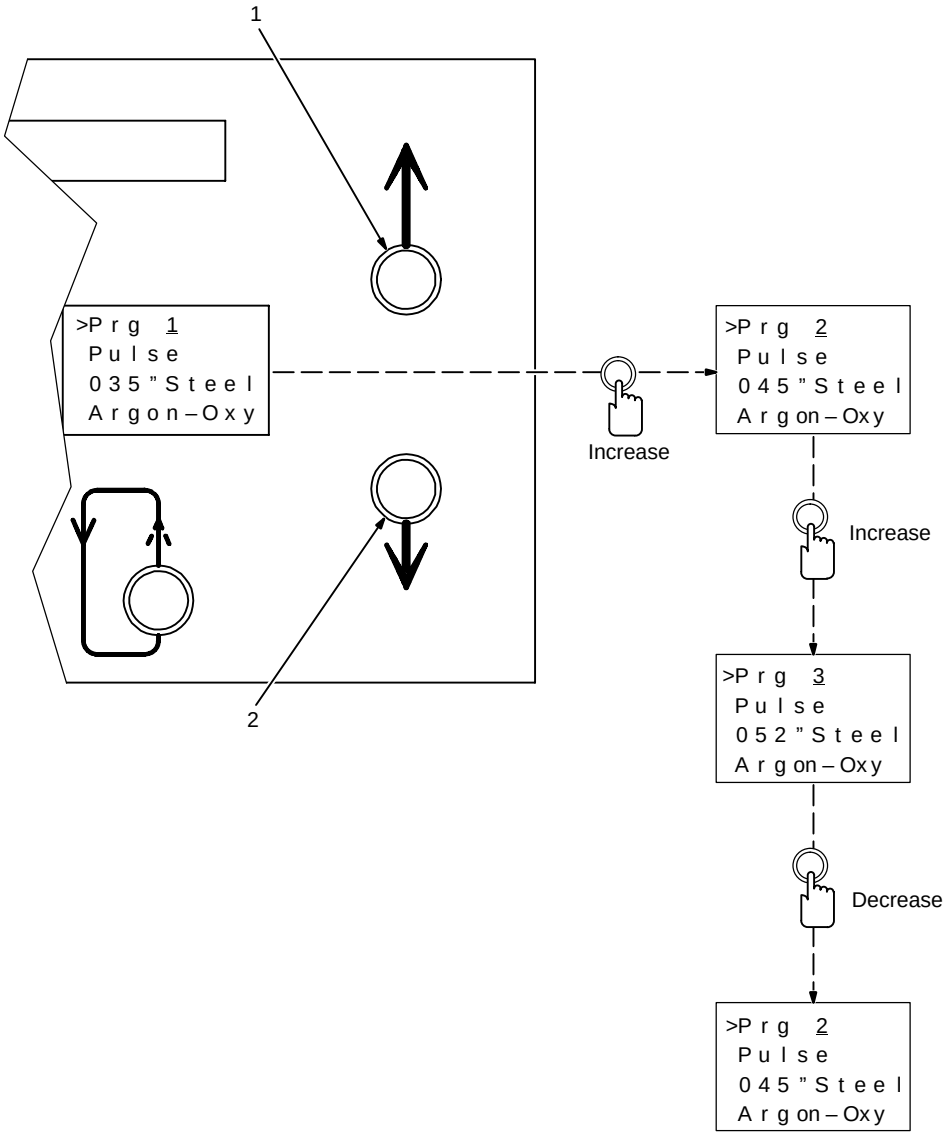
Press button to increase value that is underlined by the moving line.

2 Decrease Button

Press button to decrease value that is underlined by the moving line.

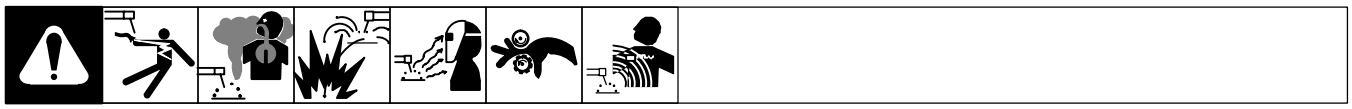


Pulse Panel

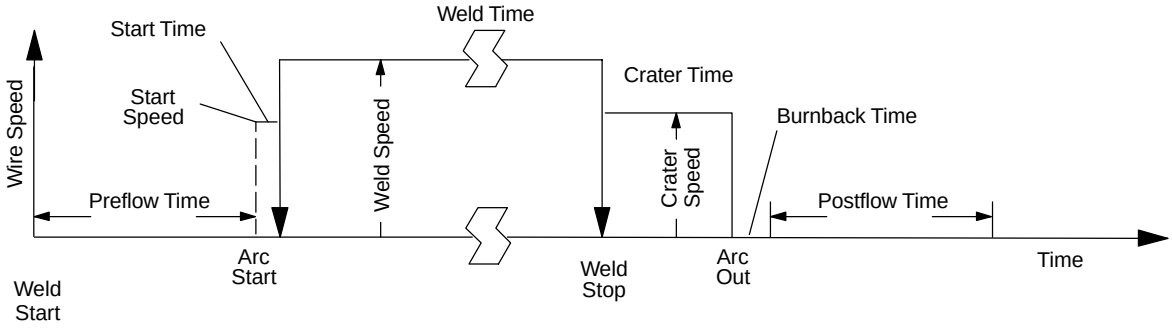


Ref. ST-154 109

SECTION 6 – GETTING STARTED FOR PULSE WELDING



6-1. Weld Cycle



Ref. S-0271

NOTE ☞

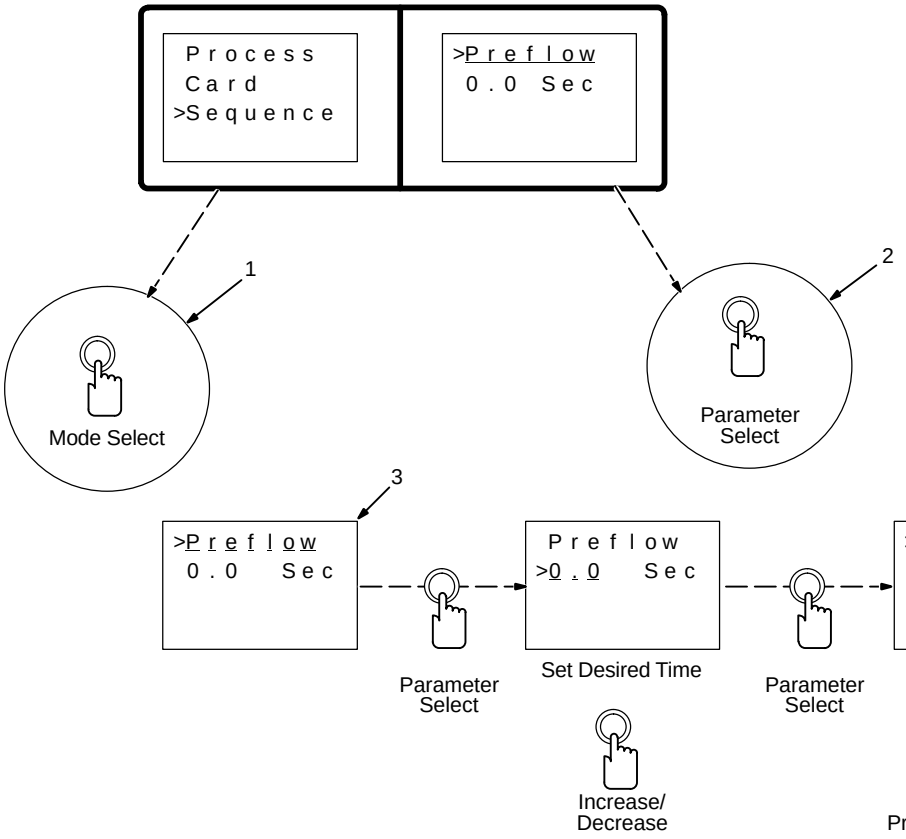
The type of robot being used is defined during the setup process (see Section 10). The Robot type indicates which parts of the weld cycle the robot controls.

When the Robot type selected is Control of Power Source, Wire, Gas, & Analog, there is only start condition programming capability and the robot controls the remaining program sequences.

When the Robot type selected is Control of Arc On & Analog Inputs, only preflow and postflow are programmable.

When the Robot type selected is Arc On & No Analog Inputs, preflow, weld, crater, and postflow are programmable.

6-2. Setting Preflow Sequence Display



1 Mode Select Button

When unit is turned On, Process is the default mode, at other times, use mode select button to select Sequence.

2 Parameter Select Button

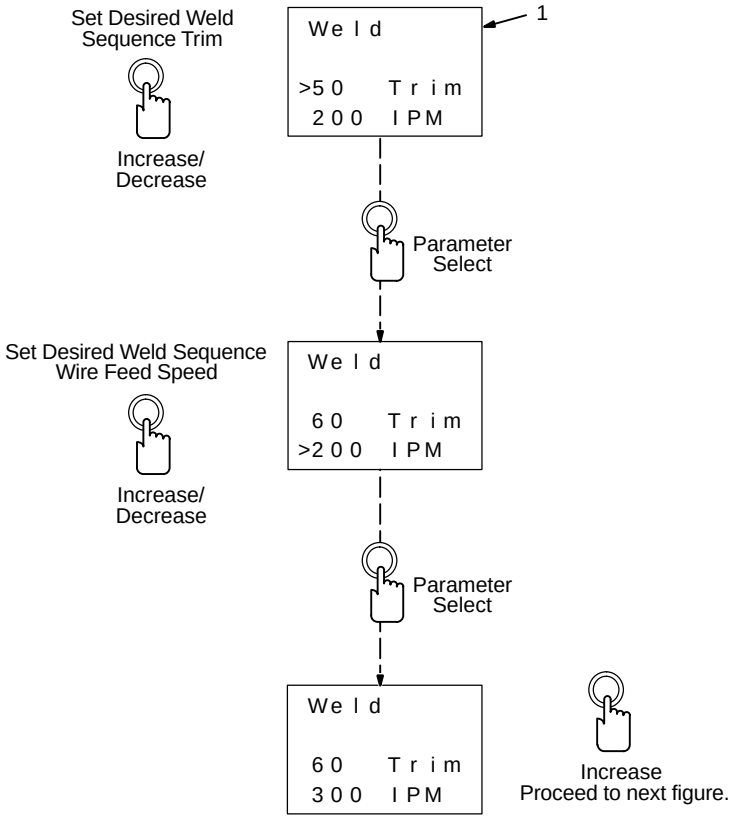
Use parameter select button to select parameters.

3 Preflow Parameters Display

Preflow can be adjusted from 0-9.9 seconds. If value set is zero (0), there is no Preflow sequence.

Go to Section 6-3.

6-3. Setting Weld Sequence Display



1 Weld Parameters Display

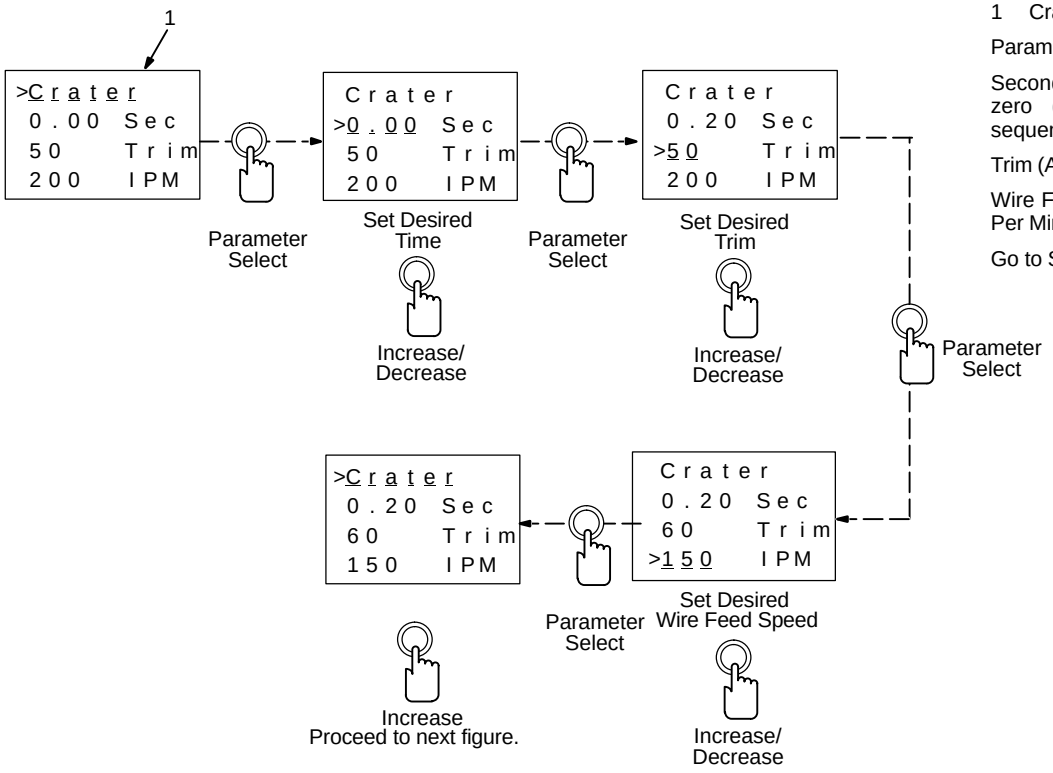
Parameter ranges are as follows:

Trim (Arc Length), 0-99

Wire Feed Speed, 50-780 Inches Per Minute, IPM

Go to Section 6-4.

6-4. Setting Crater Sequence Display



1 Crater Parameters Display

Parameter ranges are as follows:

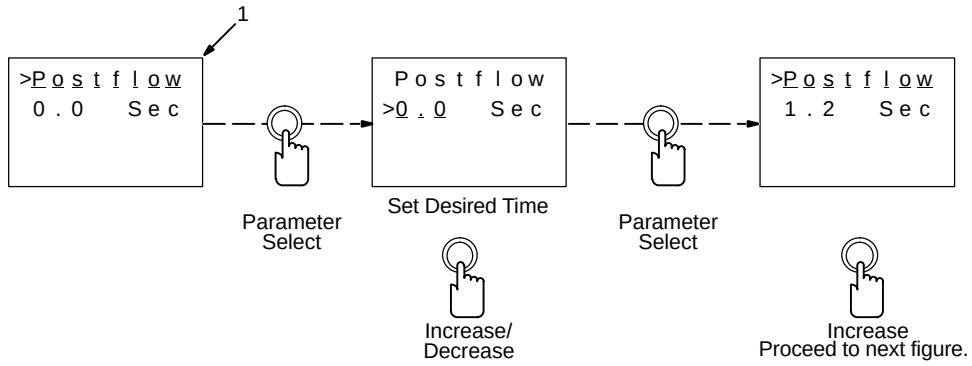
Seconds, 0-2.50 Sec. If value set is zero (0), there is no Crater sequence.

Trim (Arc Length), 0-99

Wire Feed Speed, 50-780 Inches Per Minute, IPM

Go to Section 6-5.

6-5. Setting Postflow Sequence Display



1 Postflow Parameters Display

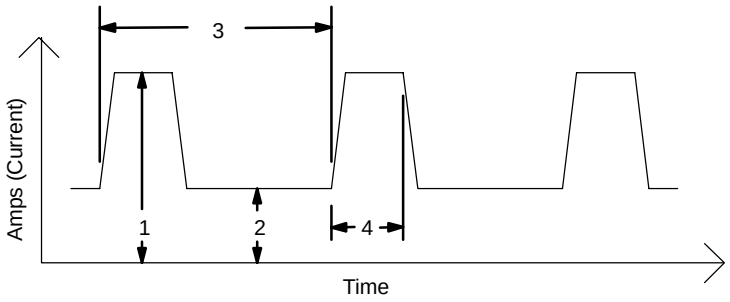
Postflow can be adjusted from 0-9.9 seconds. If value set is zero (0), there is no Postflow sequence.

SECTION 7 – TEACHING A PULSE WELDING PROGRAM

Control circuit and interface operational power are On when using or changing the microprocessor settings.

NOTE ☞ *See GMAW-P (Pulsed MIG) Process Guide supplied with unit for more information.*

7-1. Pulse Waveforms And Explanation Of Terms



The interface, not the welding power source, controls weld output for pulsed welds.

1 ApK – Peak Current Of 100-565 Amperes

ApK is the high pulse of welding current. Peak current melts the welding wire and forms a droplet. The droplet is forced into the weld puddle.

2 AbK – Background Current Of 10-200 Amperes

AbK is the low weld current. Background current preheats welding wire and maintains the arc. When background current is too low, the arc is unstable and hard to maintain.

3 PPS – Pulses Per Second Of 20-400

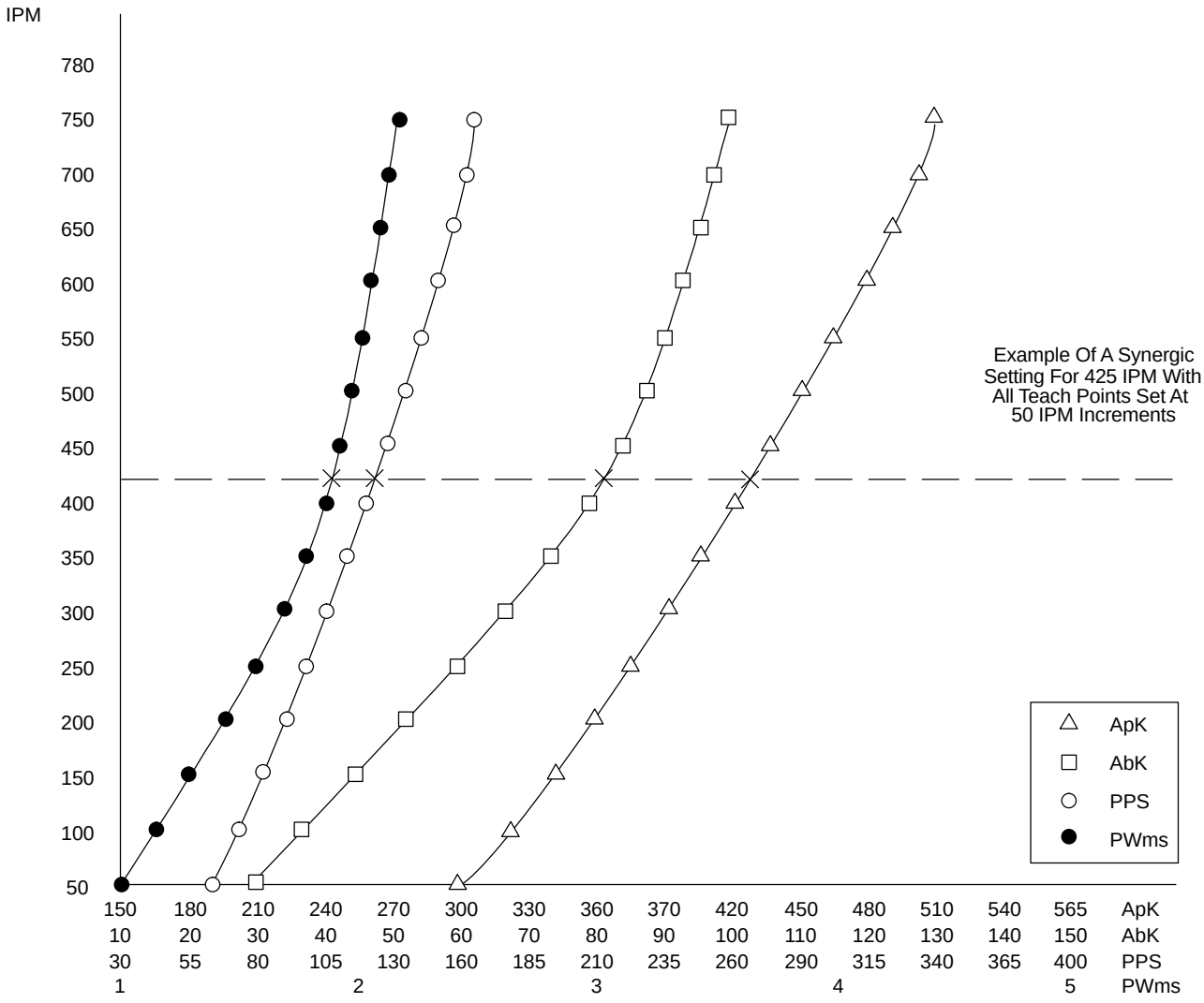
PPS, pulse rate, and frequency (Hz) are used interchangeably. A PPS or pulse rate of 60 Hz means 60 pulses of current are produced each second.

4 PWms – Pulse Width Of 1.0-5.0 Milliseconds

PWms is the time spent at peak current (1.2 ms is .0012 seconds). This time must be long enough to form a droplet of welding wire. The stiffness or fluidity of the molten weld puddle is controlled by PWms.

Ref. S-0259

7-2. Typical Teach Point Settings And Resulting Synergic Setting



The teach mode allows the user to create custom pulse MIG welding programs. The teach mode has 15 teach points. At each teach point, the user can adjust four parameters: peak amperage (ApK), background amperage (AbK), pulses per second (PPS), and pulse width in milliseconds (PWms) to shape the pulse waveform of the weld output.

Wire feed speed teach points can range from the minimum to the maximum wire feed speed of the feeder. When using a standard speed motor, wire feed speed teach points typically range from 50 to 750 ipm. The feeder uses pulse parameters at teach points to establish the pulse parameters at any wire feed speed setting.

Below the wire feed speed of the lowest teach point, and above the wire feed speed of the highest teach point, the unit may limit wire feed speed settings in pulse MIG to maintain all pulse parameters within the capability of the unit.

Pulse MIG programs made by the manufacturer have pulse waveform information entered for all 15 teach points. The operator can relocate and modify the setting of one, or any number of the 15 teach points if the factory set information is not appropriate for a specific application.

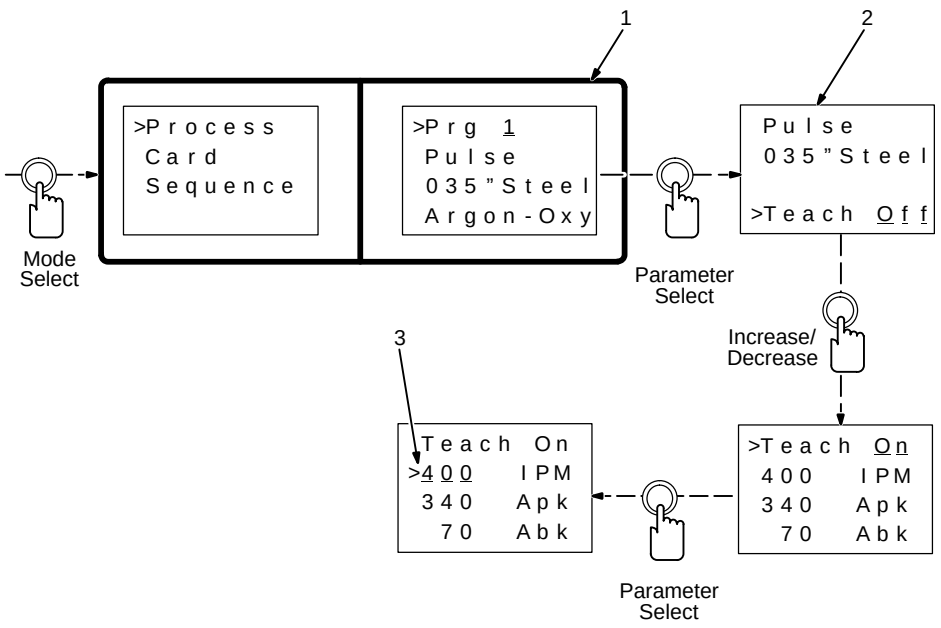
After the parameters for each teach point are established, an arc must be struck and maintained for at least 5 seconds in teach mode. This allows the wire feeder to learn the arc voltage length associated with the taught pulse parameters. To ensure a proper arc length reading, electrode stick-out must be carefully maintained.

The taught arc length represents a Trim (arc length) setting of 50. Increasing the value of Trim, increases the actual arc length. Likewise, decreasing the value of Trim will decrease actual arc length.

In the Pulse mode, the unit does not maintain a constant arc length with variations in electrode stick-out. In the Adaptive Pulse mode, the unit adjusts pulse frequency to maintain a constant arc length regardless of variations in electrode stick-out.

Proceed to next section to teach a pulse MIG program.

7-3. Selecting Teach Point Wire Feed Speed



1 Process Display

When unit is first turned On, Process is the default screen, at other times use mode select button to select Process.

2 Teach Display

Use parameter select button to select Teach.

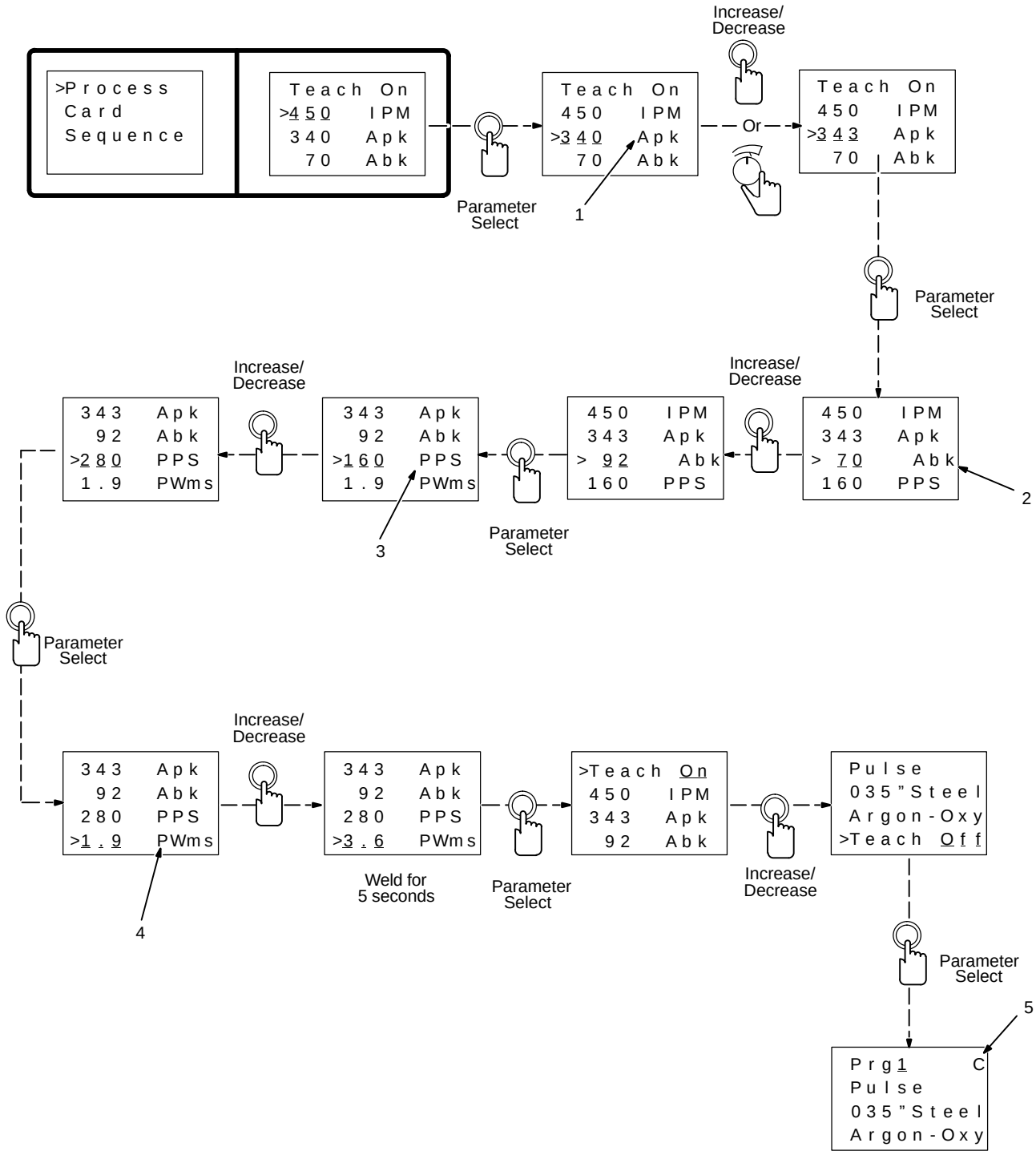
Use increase/decrease buttons to select On.

3 IPM (Teach Point)

The parameters associated with this wire feed speed teach point can be modified. The wire feed speed value itself cannot be changed from this unit.

To set or adjust teach point parameters, go to Section 7-4.

7-4. Setting Teach Point Parameters On The Pulse Panel



When the Process Teach mode is On, and one of the following pulse parameters is selected: ApK, AbK, PPS, or PWms, the pulse panel displays the selected pulse parameter instead of Trim (arc length). When the pulse parameter is selected, the value can be changed with the pulse panel controls as follows:

1 ApK Display

2 AbK Display

3 PPS Display

4 PWms Display

When values have been set for a teach point, strike and maintain an arc for five seconds. Repeat procedure at each teach point until custom program is complete (see Section 7-2).

Turn Teach mode Off.

5 Custom Pulse Screen

The letter C will appear in the upper right corner of all customized programs.

Customized programs can be reverted back to factory-set values through memory reset (see Section 10-15).

NOTE ☞	*Make copies of this chart for future use.*

Program #_____ **Wire Size/Type**_____ **Gas**_____

Program Name_____ **Card #**_____

Gun Model_____ **Flowrate**_____**CFH**

IPM	ApK	AbK	PPS	PWms	COMMENTS

Preflow:_____ **Sec.**

Run-In Trim:_____ **IPM:**_____ **Sec.:**_____

Crater Trim:_____ **IPM:**_____ **Sec.:**_____

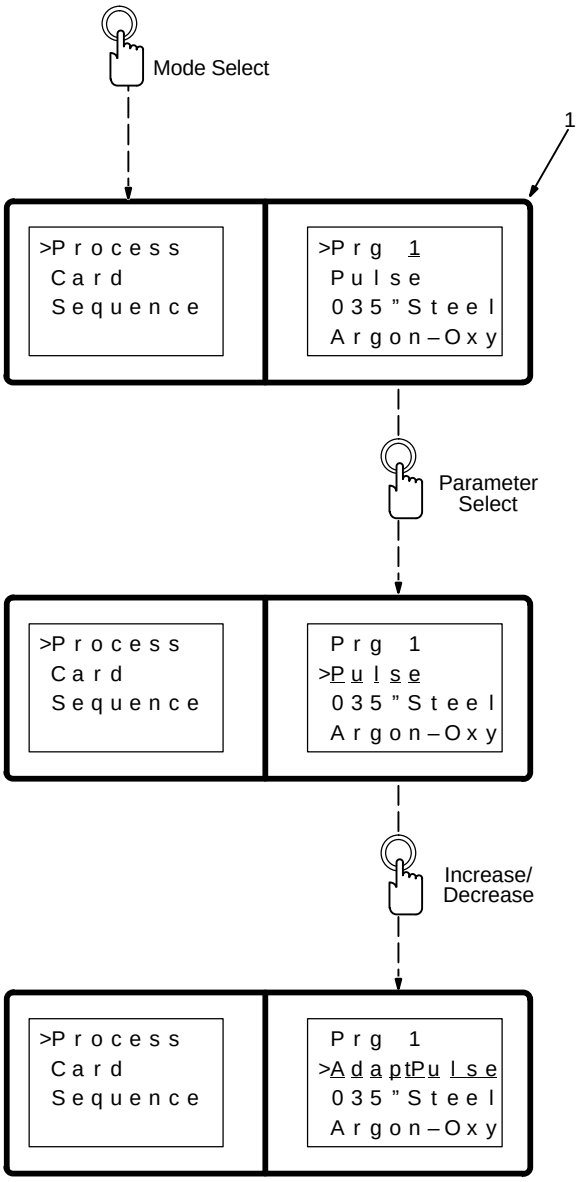
Postflow:_____ **Sec.**

7-5. Changing To Adaptive Pulse Welding

Welding parameters are the same for both a Pulse and an Adaptive Pulse welding program. While welding adaptively, the unit uses feedback to attempt to maintain a constant arc length. To change to Adaptive Pulse welding, proceed as shown:

1 Pulse Panel Display

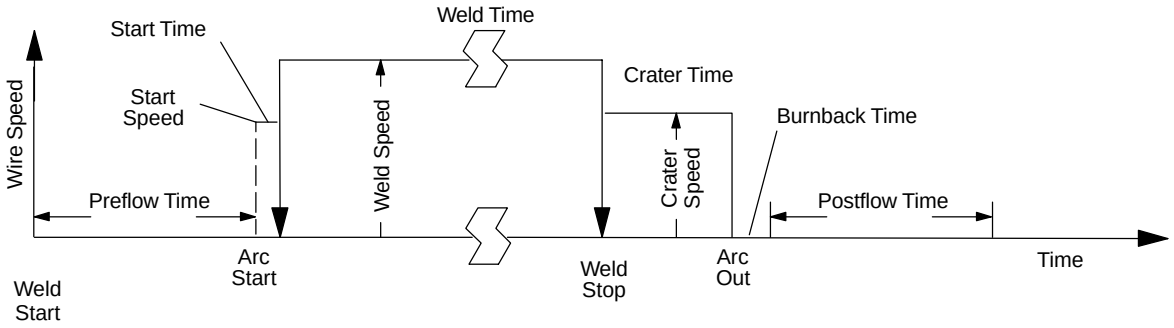
Default display when unit is first turned On, at other times use mode select button to select Process.



SECTION 8 – TEACHING A MIG WELDING PROGRAM

Control circuit and interface operational power are On when using or changing the microprocessor settings.

8-1. Weld Cycle



Ref. S-0271

NOTE ☞

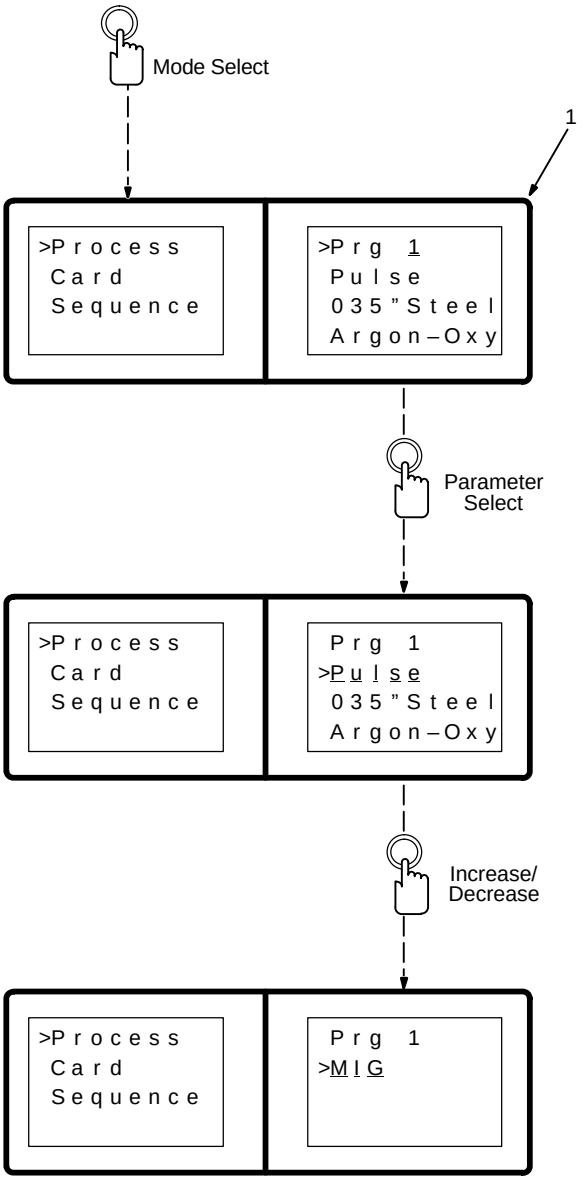
The type of robot being used is defined during the setup process (see Section 10). The Robot type indicates which parts of the weld cycle the robot controls.

When the Robot type selected is Control of Power Source, Wire, Gas, & Analog, only the start time, level, and speed are programmable.

When the Robot type selected is Control of Arc On & Analog Inputs, preflow; start time, level, and speed; burnback time and level; and postflow are programmable.

When the Robot type selected is Arc On & No Analog Inputs, preflow; start time, level, and speed; weld level and speed; crater time, level, and speed; burnback time and level; and postflow are programmable.

8-2. Changing To MIG In The Process Mode



1 Pulse Panel Display

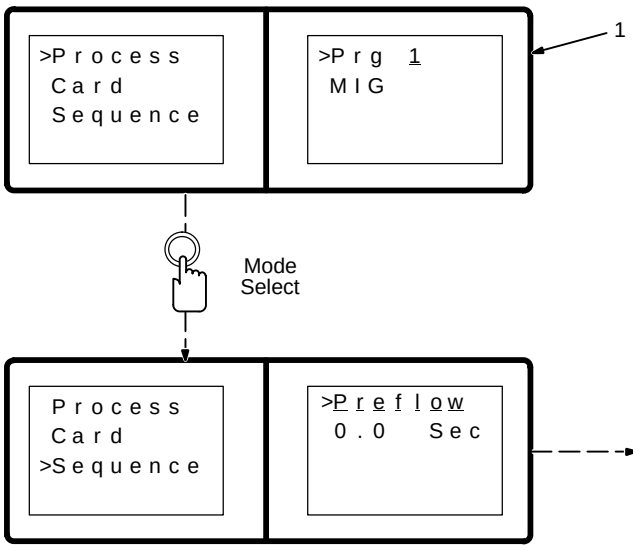
Default display when unit is first turned On, at other times use mode select button to select Process.

Go to Section 8-3A.

8-3. Setting Sequence MIG Welding Parameters

Control circuit and interface operational power are On when using or changing the microprocessor settings.

A. Setting Preflow Sequence Display



1 Pulse Panel Display

When unit is turned On, Process is the default mode. Use mode select button to select Sequence.

2 Parameter Select Button

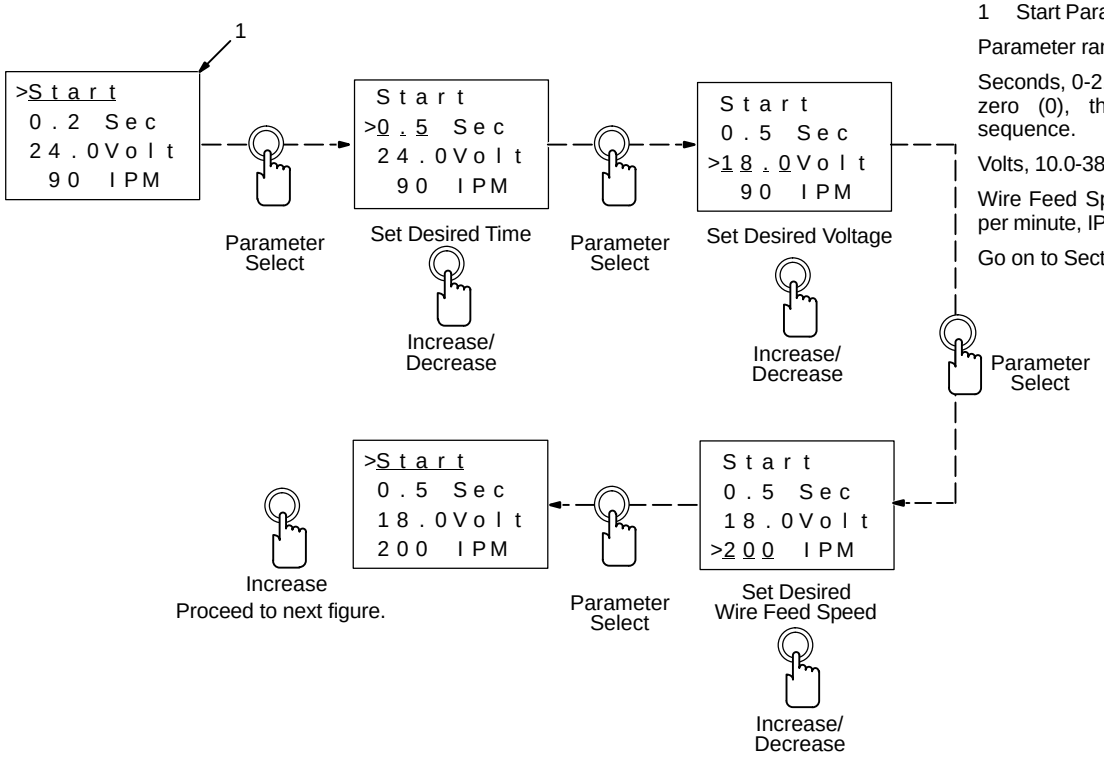
Use parameter select button to select parameters.

3 Preflow Parameters Display

Preflow can be adjusted from 0-9.9 seconds. If value set is zero (0), there is no Preflow sequence.

Go to Section 8-3B.

B. Setting Start Sequence Display



1 Start Parameters Display

Parameter ranges are as follows:

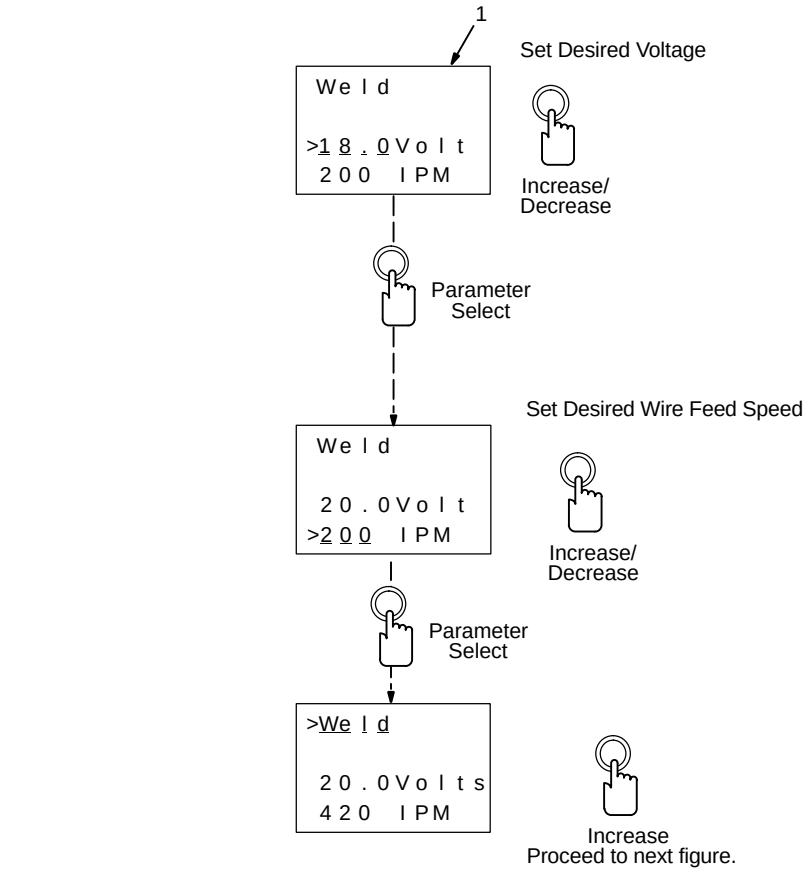
Seconds, 0-2.5 Sec. If value set is zero (0), there is no Run-In sequence.

Volts, 10.0-38.0 Volts

Wire Feed Speed, 50-780 inches per minute, IPM

Go on to Section 8-3C.

C. Setting Weld Sequence Display



1 Weld Parameters Display

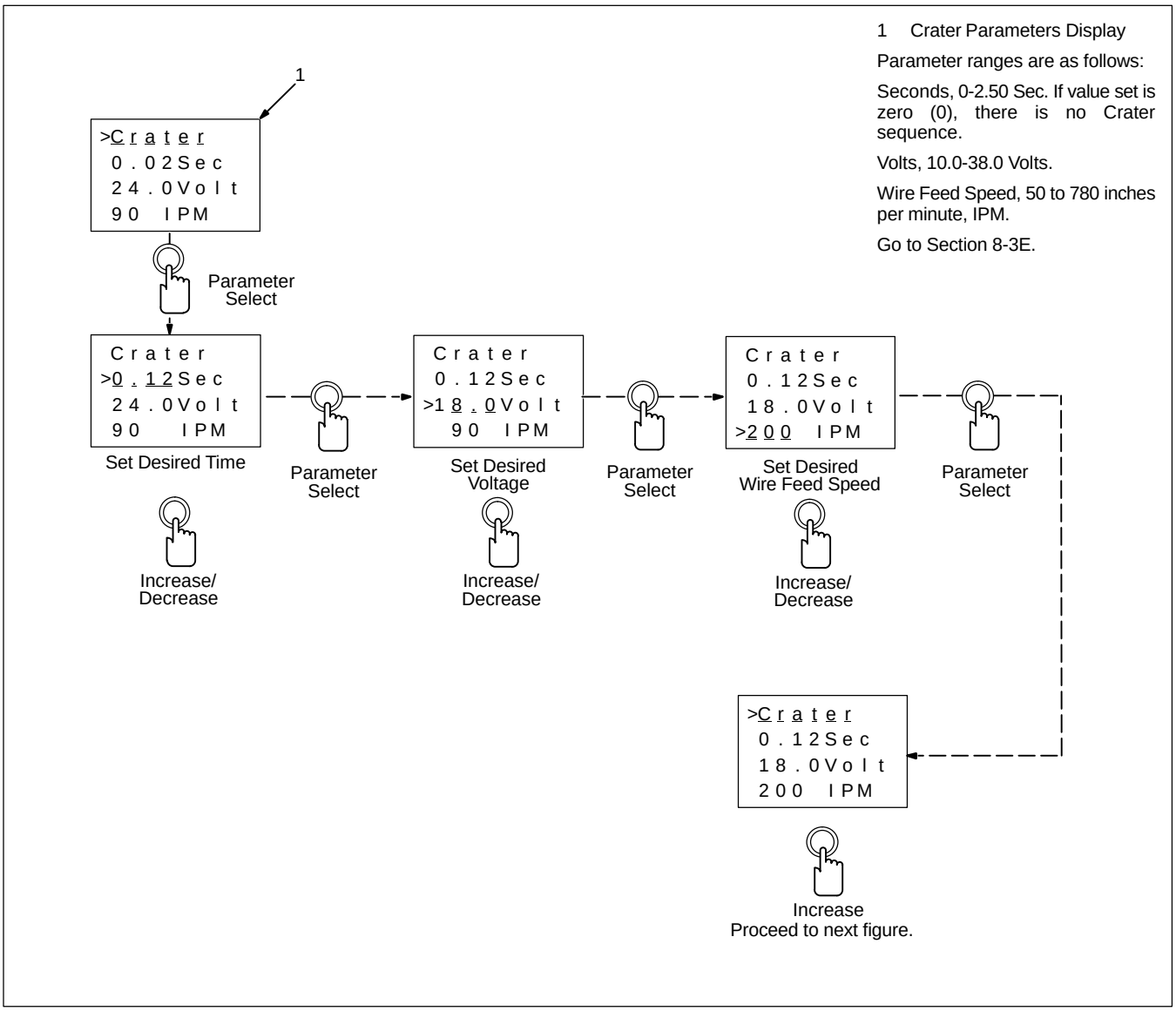
Parameter ranges are as follows:

Volts, 10.0-38.0 Volts

Wire Feed Speed, 50-780 Inches Per Minute, IPM

Go to Section 8-3D.

D. Setting Crater Sequence Display



1 Crater Parameters Display

Parameter ranges are as follows:

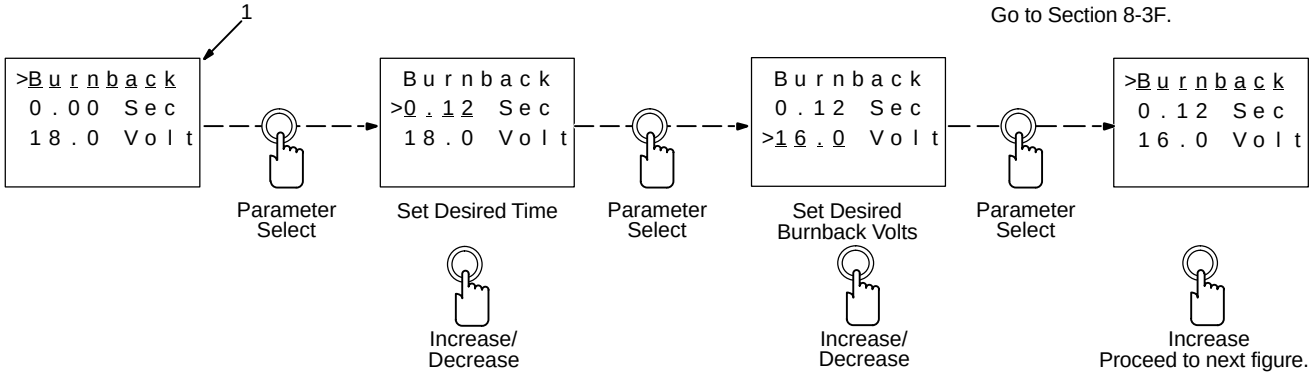
Seconds, 0-2.50 Sec. If value set is zero (0), there is no Crater sequence.

Volts, 10.0-38.0 Volts.

Wire Feed Speed, 50 to 780 inches per minute, IPM.

Go to Section 8-3E.

E. Setting Burnback Sequence Display



1 Burnback Parameters Display

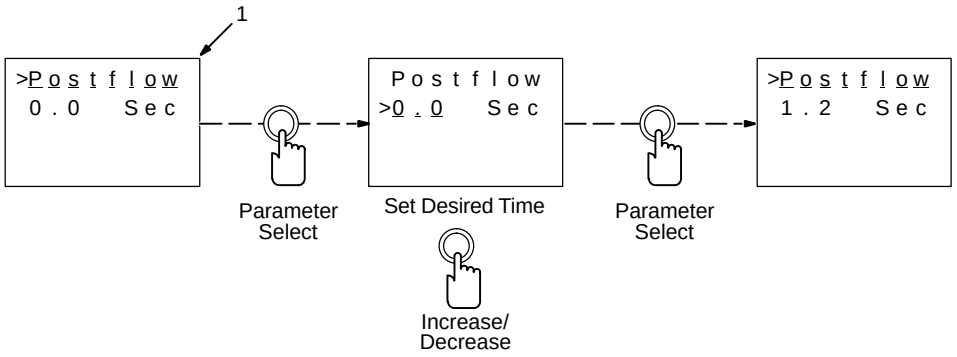
Parameter ranges are as follows:

Volts, 10.0-38.0 Volts

Seconds, 0-0.25 seconds. If value set is zero (0), there is no Burnback sequence.

Go to Section 8-3F.

F. Setting Postflow Sequence Display

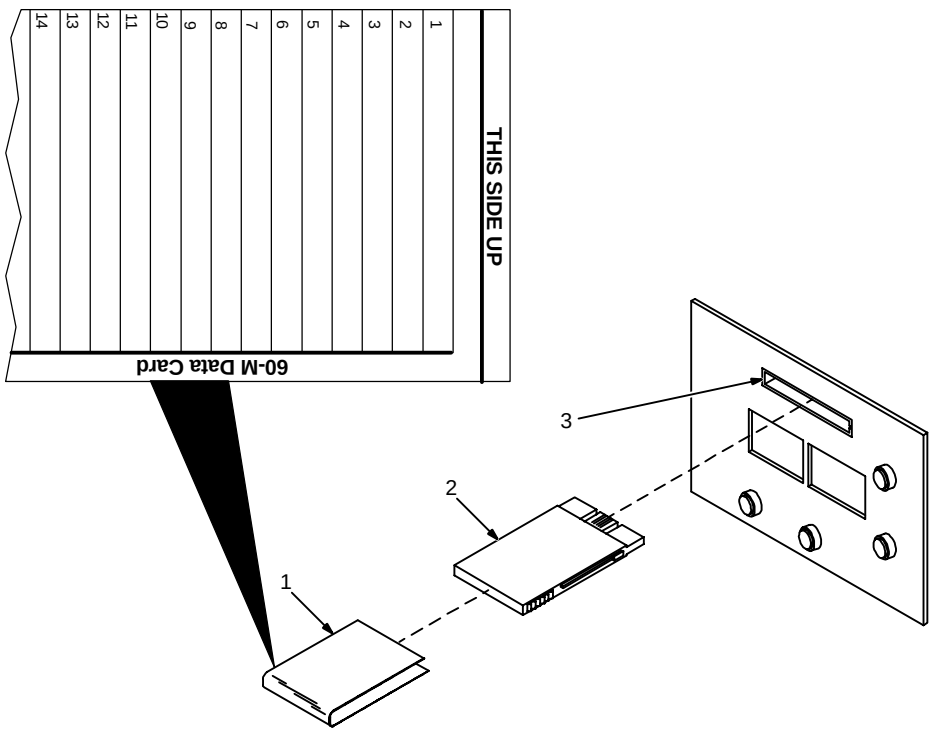


1 Postflow Parameters Display

Postflow can be adjusted from 0-9.9 seconds. If value set is zero (0), there is no Postflow sequence.

SECTION 9 – USING THE OPTIONAL DATA CARD

9-1. Installing Data Card



1 Label

Peel backing from label and apply to data card with THIS SIDE UP by metal pins.

Write the names of the programs stored on the card on the label. Write the name of the piece of equipment the card is used with on the label.

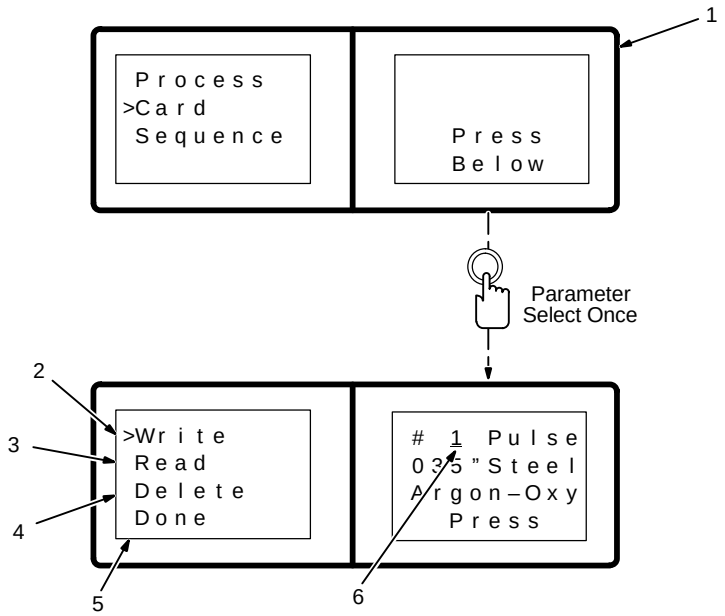
2 Data Card

3 Card Slot

Insert card into slot. To format card, turn On power to the unit. Select Card from menu. Data card formats when unit enters Card mode. Exit Card mode and turn Off power.

ST-156 266-B / Ref. S-155 823

9-2. Data Card Displays



Use Mode Select button to select Card.

1 Card Display

2 Write

Used to transfer program data from unit to card. The program card can hold up to 32 programs. When writing to the card, the next available program number is automatically assigned.

3 Read

Used to transfer program data from card to unit.

4 Delete

Used to delete program data from card.

5 Done

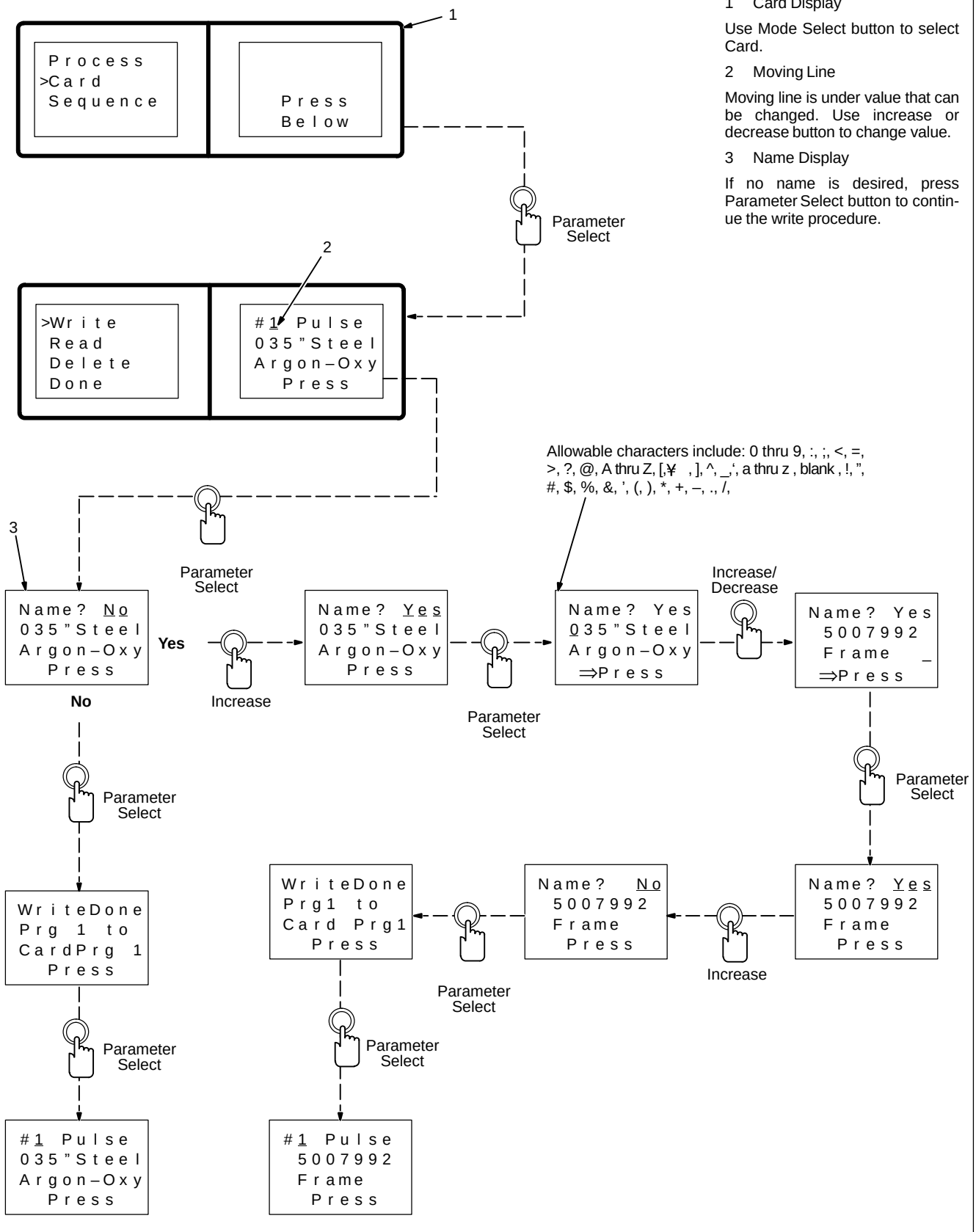
Used to exit card display.

6 Moving Line

Moving line is under value that can be changed.

9-3. Naming Programs And Writing To Card

NOTE ☞ *All program types (Pulse, Adaptive Pulse, and MIG) can be stored on a data card and retrieved.*



1 Card Display

Use Mode Select button to select Card.

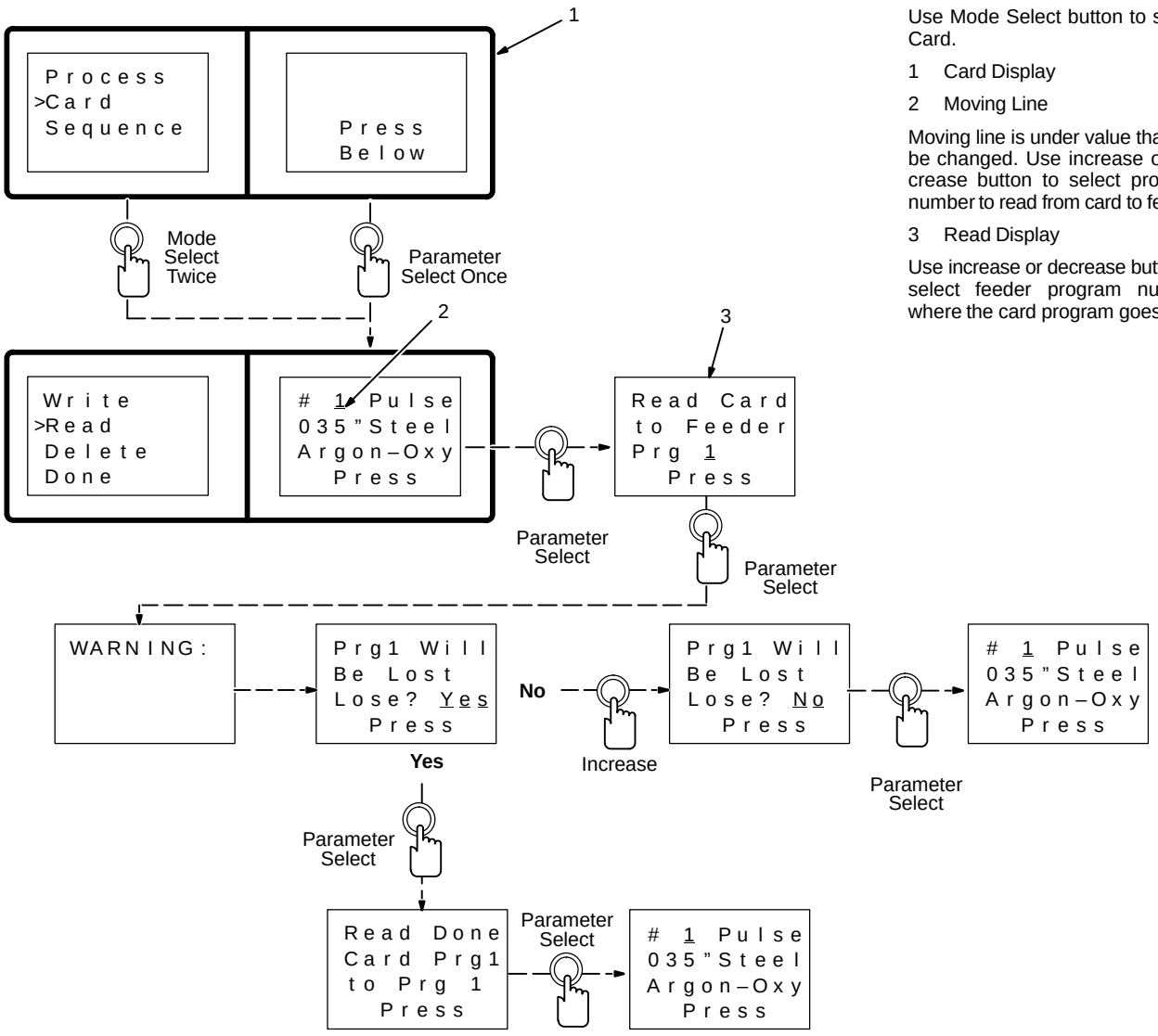
2 Moving Line

Moving line is under value that can be changed. Use increase or decrease button to change value.

3 Name Display

If no name is desired, press Parameter Select button to continue the write procedure.

9-4. Reading From Card



Use Mode Select button to select Card.

1 Card Display

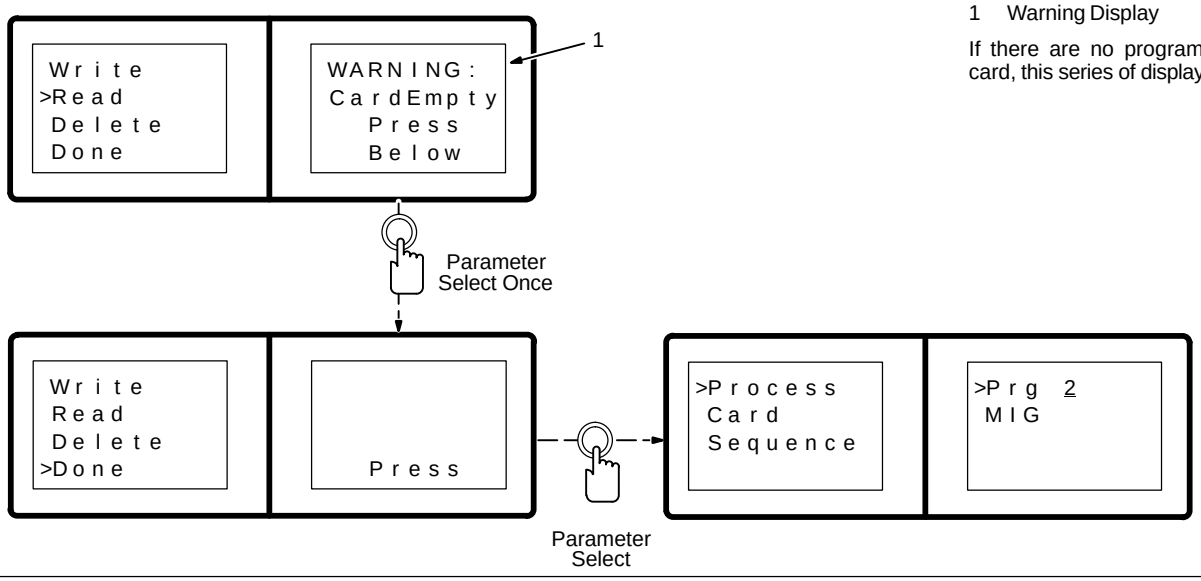
2 Moving Line

Moving line is under value that can be changed. Use increase or decrease button to select program number to read from card to feeder.

3 Read Display

Use increase or decrease button to select feeder program number where the card program goes.

9-5. Reading (Or Deleting) From An Empty Card



1 Warning Display

If there are no programs on the card, this series of displays appear.

9-6. Deleting Programs From Card

Use Mode Select button to select Card.

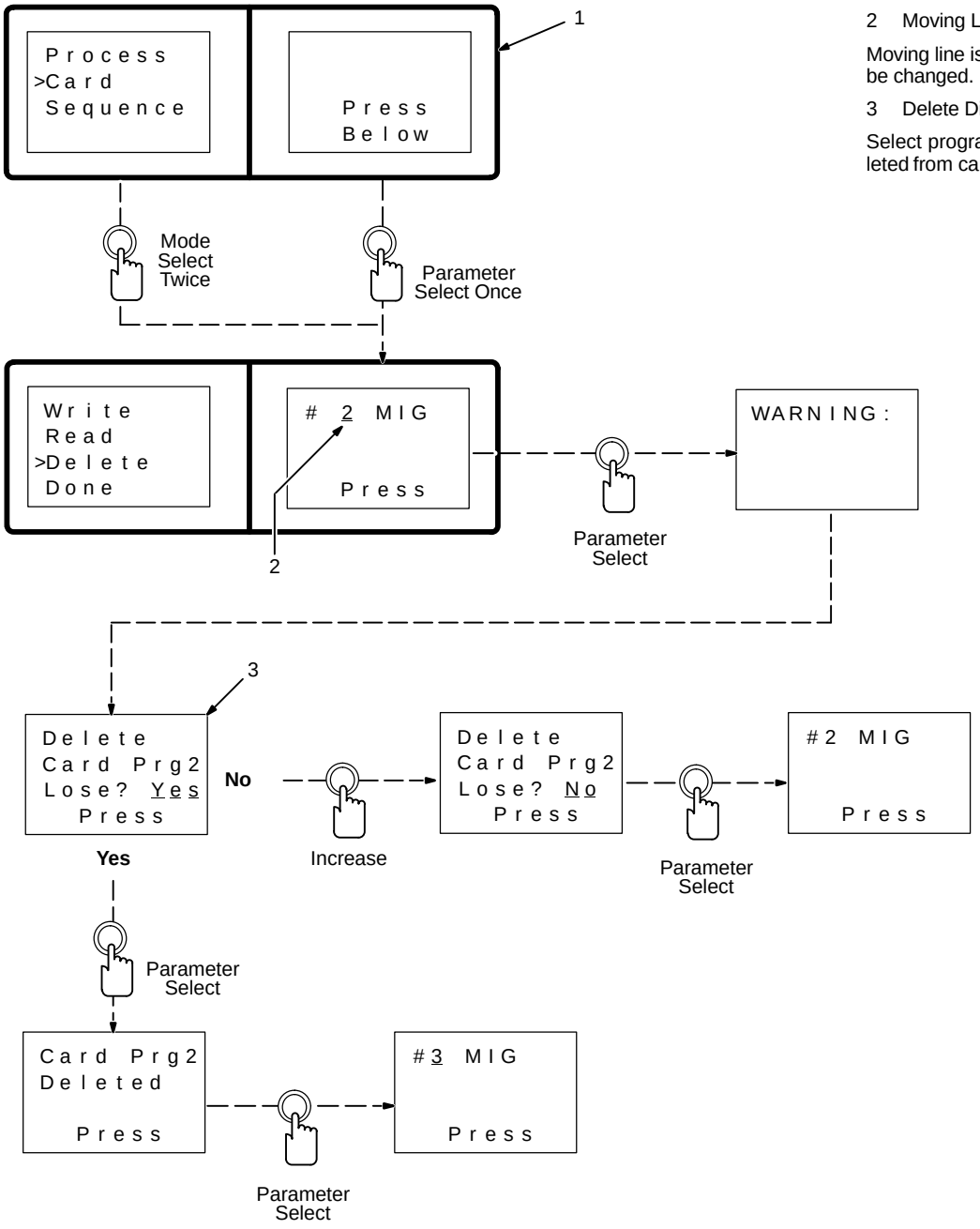
1 Card Display

2 Moving Line

Moving line is under value that can be changed.

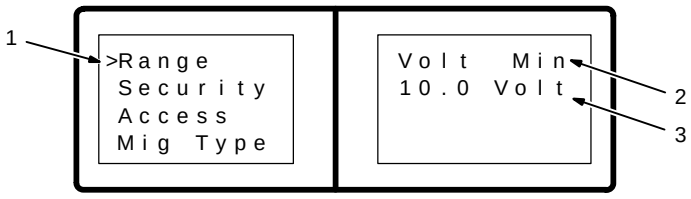
3 Delete Display

Select program number to be deleted from card.



SECTION 10 – SETUP

10-1. Setup Flow Chart



Example Of Pulse Panel Setup Display

1 Display Selections

2 Features

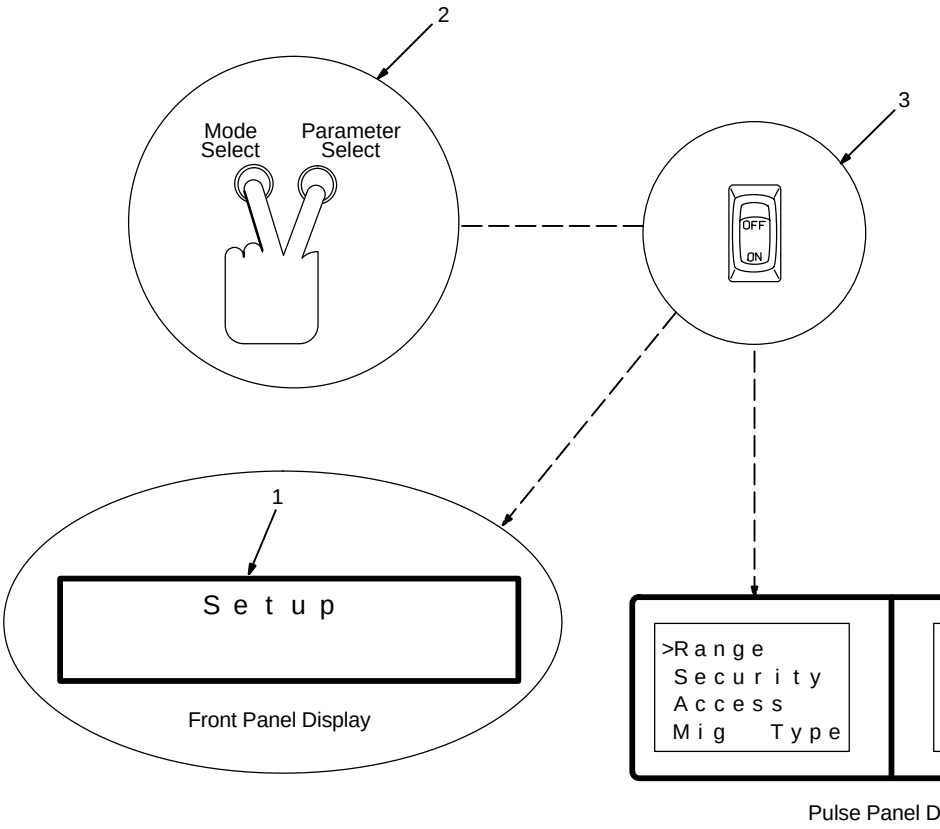
3 Settings

To set up features that customize operation, use the setup displays. Features that can be customized are as follows:

Display Selection	Features	Settings	Section
>Range	Volt Min	0.0 - 25.0 V	10-3
	Volt Max	25.0 - 99.9 V	
	Amp Min	0 - 50 A	
	Amp Max	50 - 999 A	
Press Mode Select To Go To Next Set-up Display			
>Security	Program	Number	10-4
	Lock	Off/On	
>Access	Code	Off/On	10-5
>Mig Type	Voltage Correction	DVC On/Off	10-6
>Inductance	Level	0.0 - 99	10-7
>Purge	Button Timer	0.0 - 25.0	10-8
>Voltage	Control Feedback	17-Pin Volt Sense	10-9
>Arc Start	Arc Start Type	Standard Hot Start Soft Start	10-10
>Arc Time	Run Hours	0–9999.99 Hours 0–999,999 Cycles	10-11
	No Reset		
	Reset		
>Wire Feed	Display	IPM/MPM	10-12
	Motor Type	Standard Low Speed High Speed	

Display Selection	Features	Settings	Section
>Wiretype	Wire Type In Feeder	Hardwire/Softwire	10-13
>Display		Actual Amps Command	10-14
>Memory	No Reset		10-15
	Program Reset Memory Reset		
>Shutdown	Arc Start/ Volt Sense	Off/On	10-16
>Name	Card Programs	Off/On	10-17
>Program	Remote Program	Off/On	10-18
>Stick	Stick Check	Off/On	10-19
>Jog IPM	IPM	50 - 780	10-20
>Robot			10-21
>Monitor	Arc Volt Error	Off/On	10-22
	Range	0.1 - 9.9	
	Sec	0.1 - 25	
>Software	Version Number		10-23

10-2. Using Setup Displays



1 Front Panel Setup Display

Front panel display during setup.

2 Pulse Panel Mode And Parameter Select Buttons

3 Power Switch On Rear Panel

Press and hold down both buttons while turning On unit.

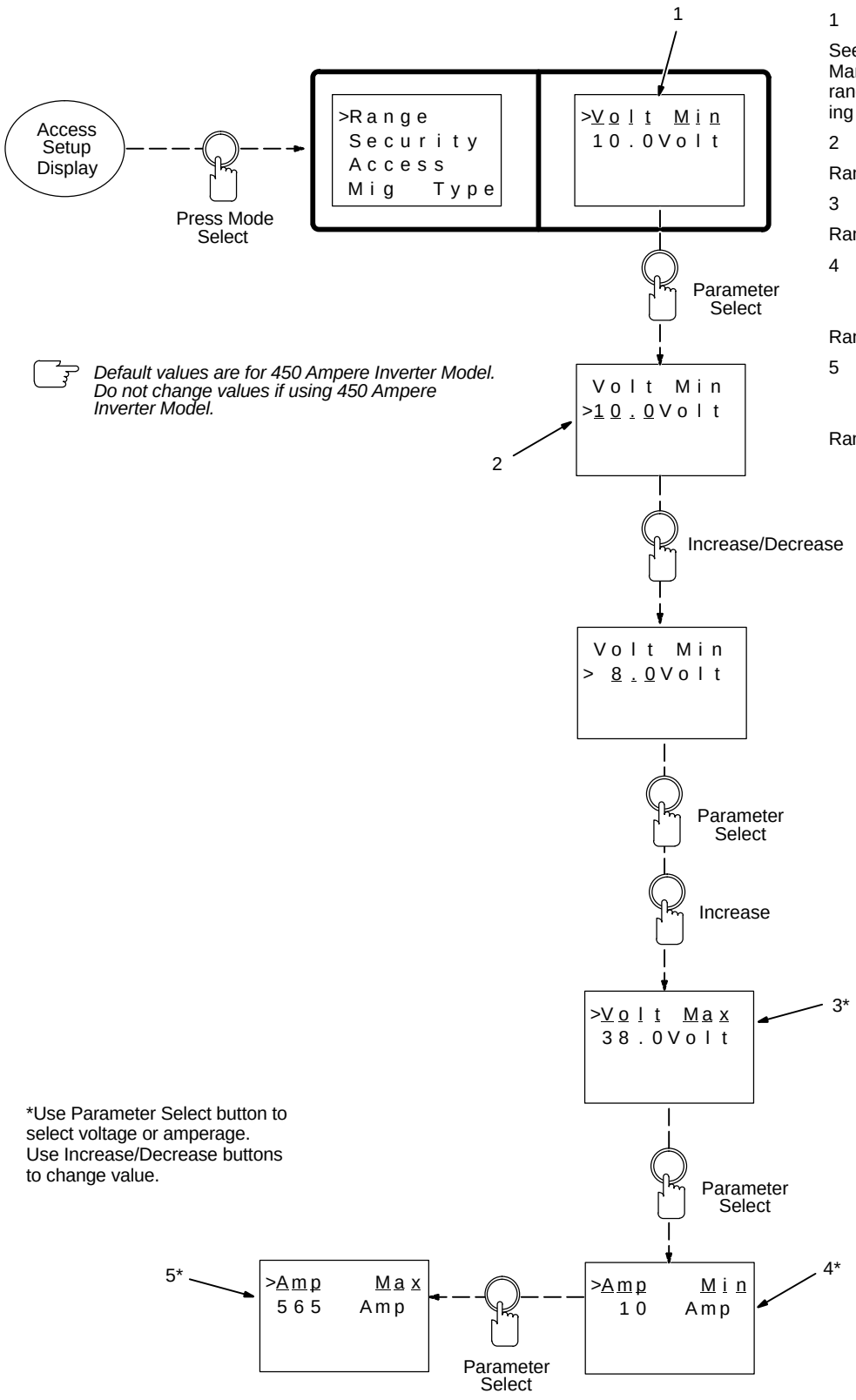
4 Pulse Panel Setup Display

Follow this procedure any time access is required. Once in the setup displays, use the Mode Select button to select a particular display.

To save any or all of the changes made while in the setup displays, and/or to exit the setup displays, turn power to the unit Off and back On.

10-3. Selecting Welding Power Source Range

NOTE ☞ *Welding power source minimum and maximum voltage values are always required. Amperage values are required for pulse welding.*



1 Range Display

See welding power source Owner's Manual for voltage and amperage ranges. Set values to match welding power source ranges.

2 Minimum Voltage Display

Range is 0 to 25.0 volts.

3 Maximum Voltage Display

Range is 25.0 to 99.9 volts.

4 Minimum Amperage Display (Available When System Set For Pulse/Mig)

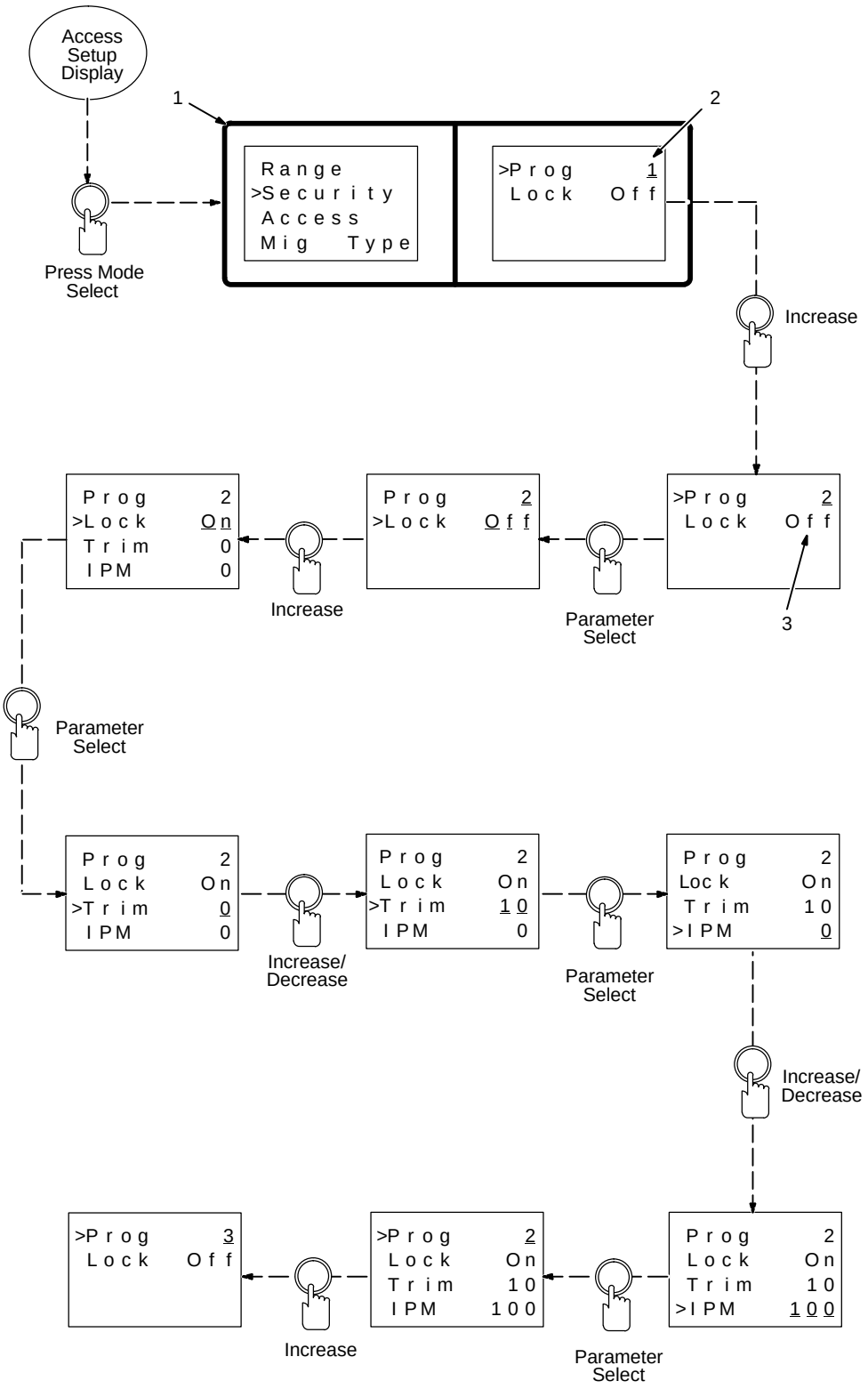
Range is 0 to 50 amperes.

5 Maximum Amperage Display (Available When System Set For Pulse/Mig)

Range is 150 to 999 amperes.

10-4. Selecting Security Lock

NOTE ☞	*Security lock works only when a data card is inserted (see Section 9).*



1 Security Display

Use this display to lock a program's weld parameters so that changes can not be made using pulse panel controls.

2 Program Number

Choose the program number (1 through 8) to be locked.

3 Program Lock Display

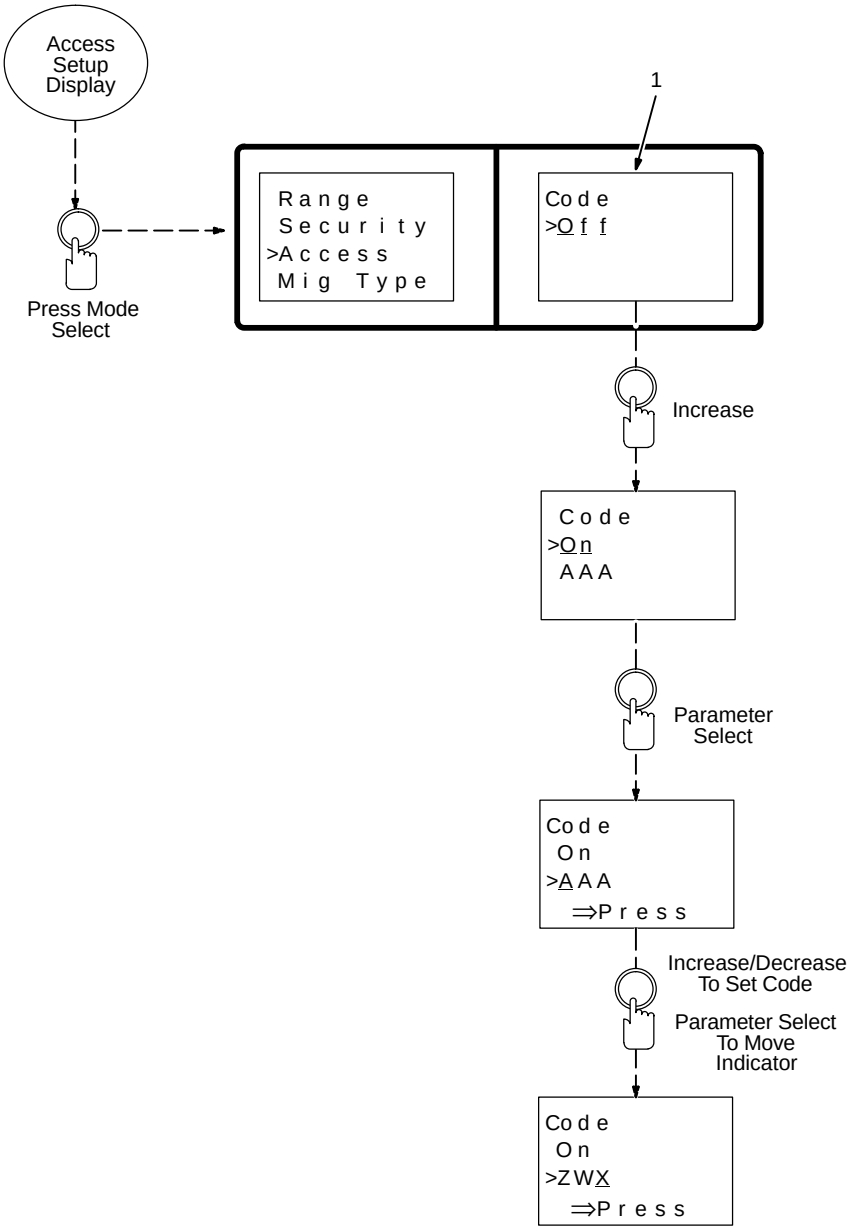
When lock is off a program, the operator can change all weld parameters of that program without restriction.

With lock on a program, the operator can change parameters of that program but the range of change is restricted.

In the example displays in this figure, the operator could change the value of trim ±10% and wire feed speed ±100 ipm from programmed values. If the settings are left at 0, the operator cannot change values from those programmed.

10-5. Selecting Or Changing Access Code

NOTE ☞	*Access code works only when a data card is inserted (see Section 9).*



1 Code Display

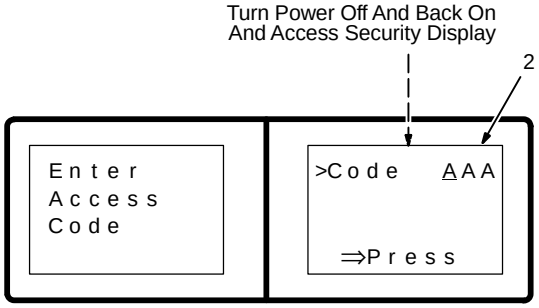
With code off, access to the setup displays is not restricted.

With code on, the operator must know and enter the access code to access or change any of the setup displays.

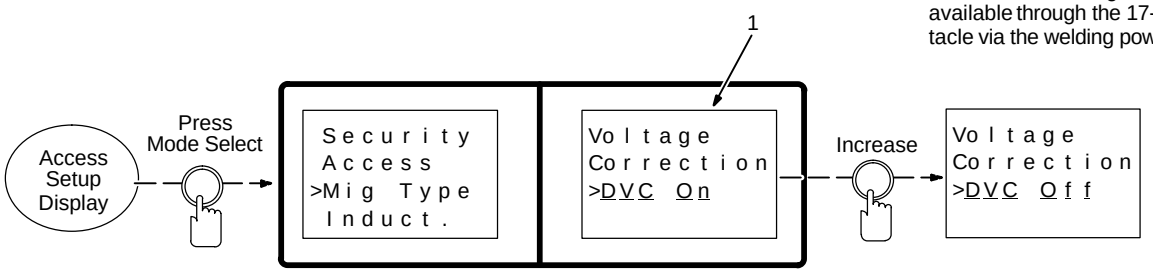
2 Access Display

With a code set, this display appears when power is turned on while holding the pulse panel Mode and Parameter Select buttons.

Press Parameter Select button to enter access code. When the correct letter is entered, the indicator automatically moves to the next character. When the final access code letter is entered, the display automatically changes to the initial setup display.



10-6. Selecting Voltage Correction



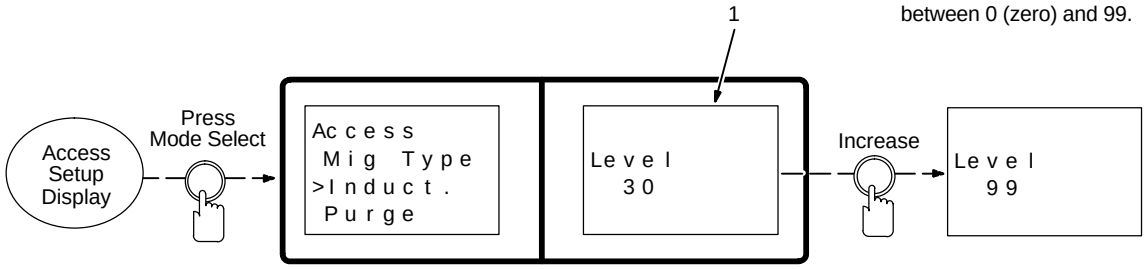
1 Mig Type Display

With DVC Voltage Correction On, the unit uses closed-loop feedback from the 17-pin cord or voltage sensing leads to maintain set voltage parameters.

With DVC Voltage Correction Off, feedback from the arc is not used for closed-loop feedback to maintain voltage parameters. Feedback from the arc is still used for other functions.

Be sure voltage sensing leads are connected or voltage feedback is available through the 17-pin receptacle via the welding power source.

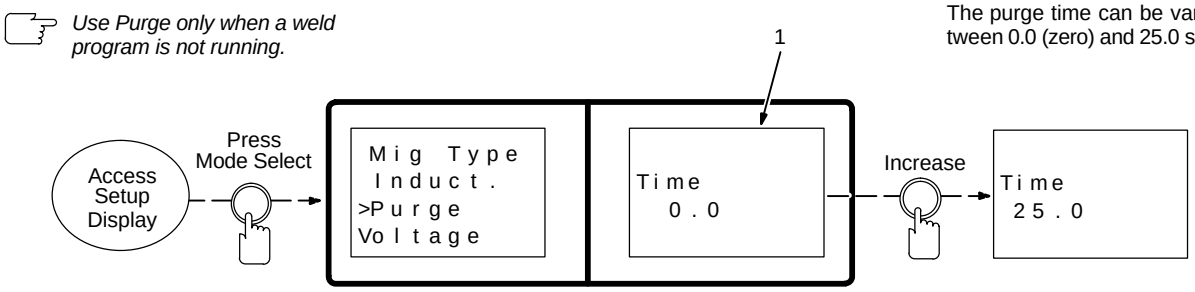
10-7. Selecting Inductance



1 Inductance Display

The inductance level can be varied between 0 (zero) and 99.

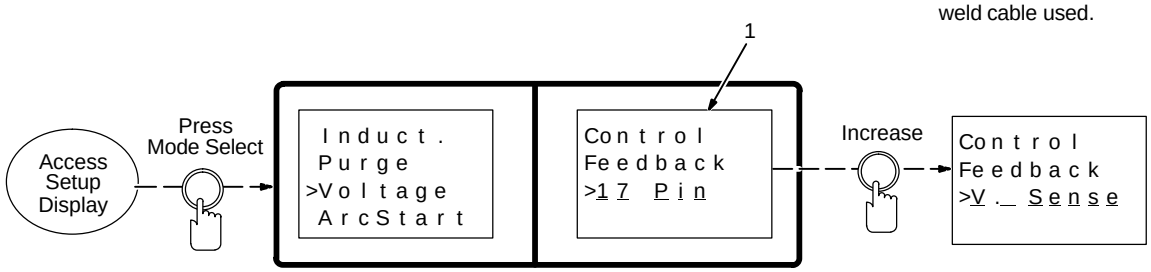
10-8. Selecting Purge Time



1 Purge Display

The purge time can be varied between 0.0 (zero) and 25.0 seconds.

10-9. Selecting Voltage Sensing Method



1 Voltage Feedback Display

When using the 17 Pin setting, arc voltage feedback is through the welding power source and the feedback signal is sent through the 17-pin cord to the feeder.

If the 17 Pin setting is used, it is recommended that the voltage sensing terminals on the welding power source be used to monitor arc voltage at the workpiece.

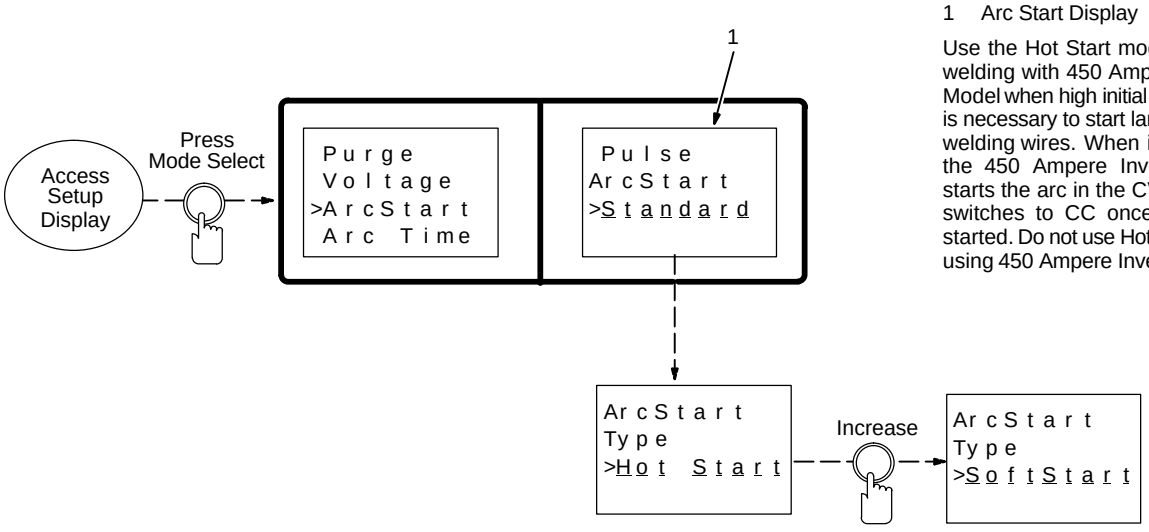
When using the V. Sense setting, arc voltage feedback is through the voltage sense leads connected to the feeder. Use this setting when there is more than 50 ft (15 m) of weld cable used.

10-10. Selecting Arc Start Method

NOTE ☞

Arc Start selection is not used when welding in non-pulsed MIG.

Do not use the Hot Start setting for .035 in (9 mm) or smaller wire.



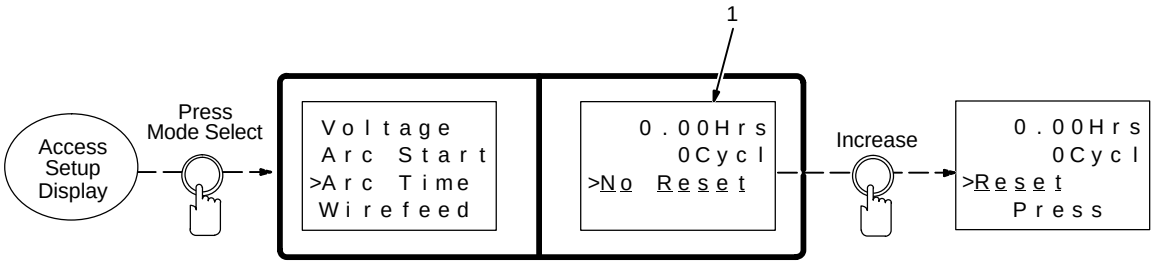
1 Arc Start Display

Use the Hot Start mode for pulse welding with 450 Ampere Inverter Model when high initial weld current is necessary to start large diameter welding wires. When in Hot Start, the 450 Ampere Inverter Model starts the arc in the CV mode and switches to CC once the arc is started. Do not use Hot Start unless using 450 Ampere Inverter Model.

10-11. Resetting Arc Time

1 Arc Time Display

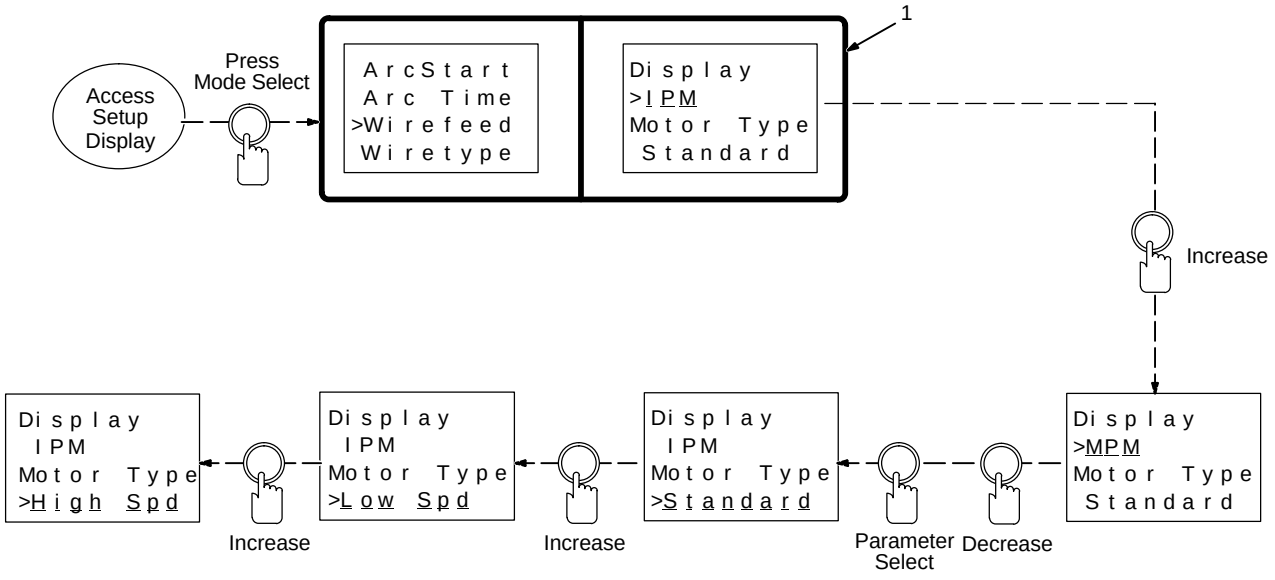
The unit accumulates arc hours up to 9999.99 hours or 999999 weld cycles before rolling over to zero (0). The arc timer can be reset using this display.



10-12. Selecting Units For Wire Feed Speed And Motor Type

1 Wire Feed Display

The displayed unit of wire speed (IPM or MPM) can be changed along with the wire feed motor type (Standard, Low Speed, or High Speed).



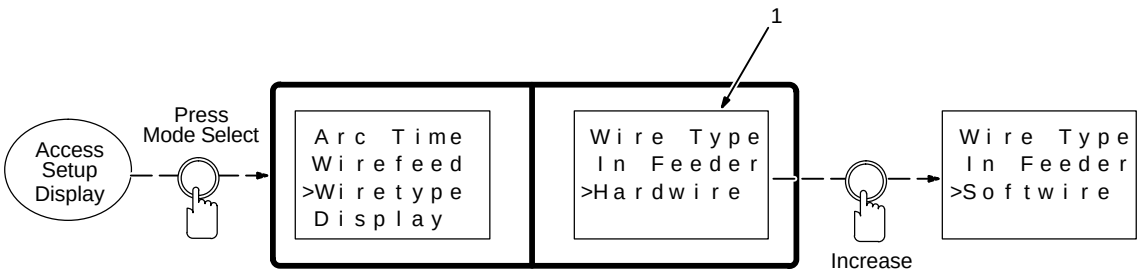
10-13.Selecting Wire Type

NOTE ☞

If wire type is changed, perform a memory reset (see Section 10-15) immediately after selecting wire type to bring up the correct welding programs.

1 Wire Type Display

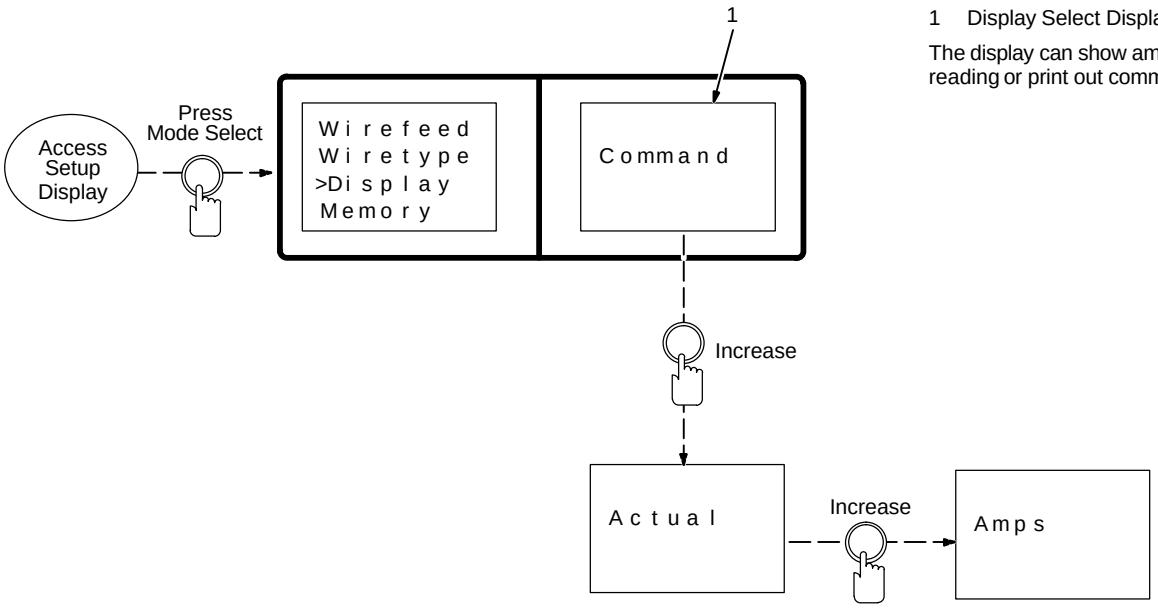
Select soft wire when using aluminum wire in the wire feeder. Select hard wire when using any other kind of wire.



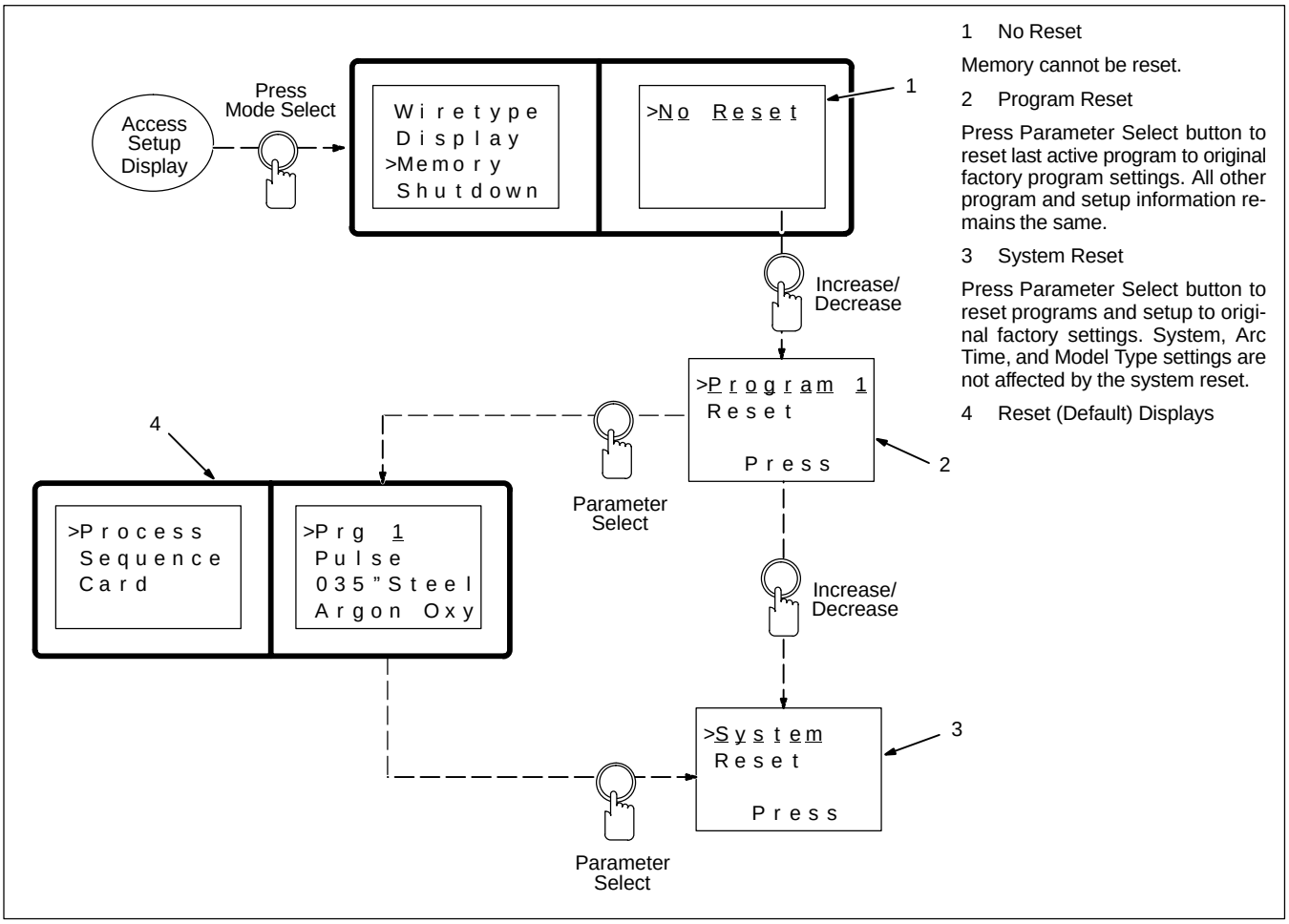
10-14.Selecting Display

1 Display Select Display

The display can show amps, actual reading or print out command.



10-15.Resetting Memory



1 No Reset

Memory cannot be reset.

2 Program Reset

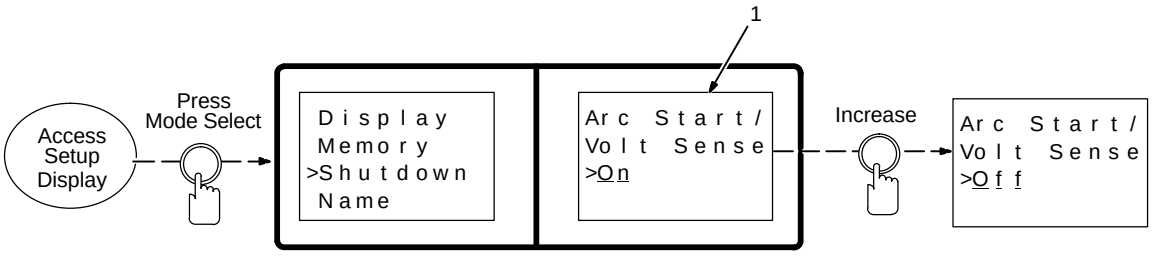
Press Parameter Select button to reset last active program to original factory program settings. All other program and setup information remains the same.

3 System Reset

Press Parameter Select button to reset programs and setup to original factory settings. System, Arc Time, and Model Type settings are not affected by the system reset.

4 Reset (Default) Displays

10-16.Selecting Arc Start/Volt Sense Error Shutdown

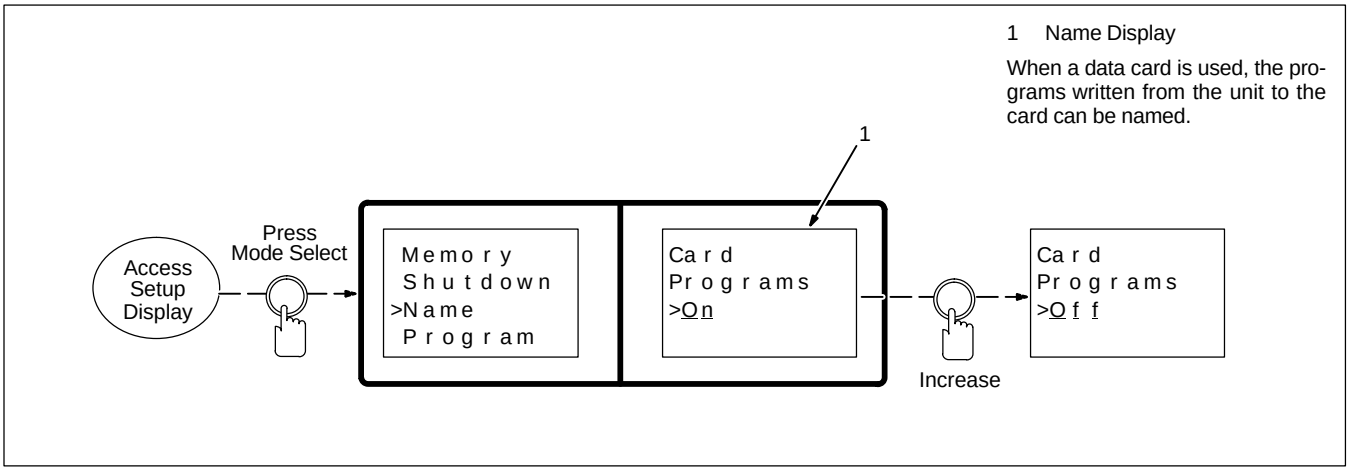


1 Voltage Shutdown Display

With Arc Start/Volt Sense on, the unit shuts down when no arc voltage is sensed. If the unit shuts down, an error message appears (see Section 12-3).

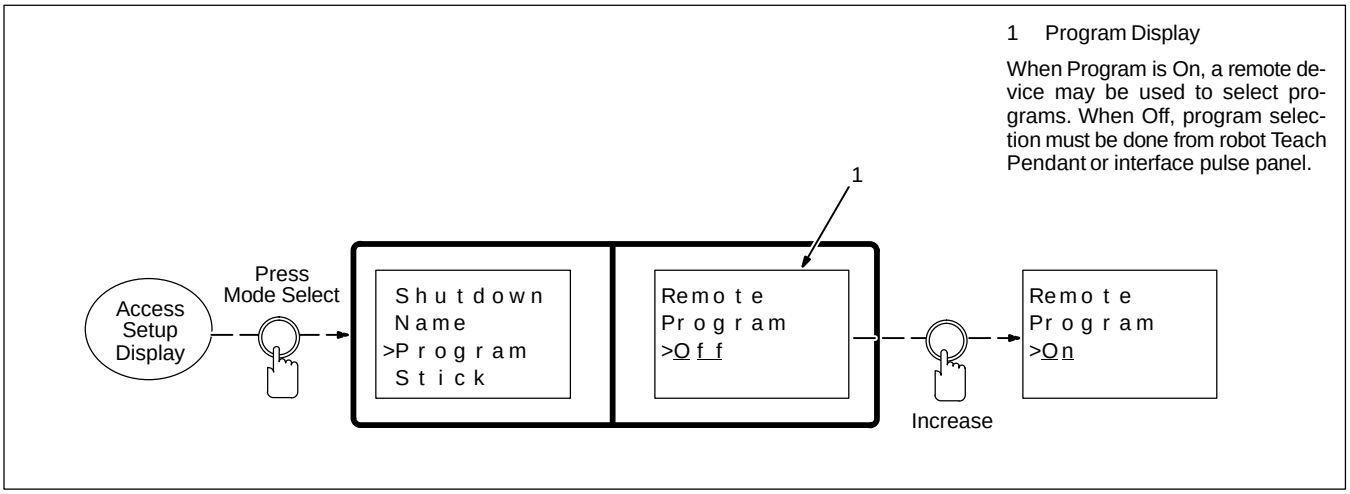
With Arc Start/Volt Sense off, the unit continues to feed wire even when there is no arc voltage sensed.

10-17.Selecting Program Name Feature

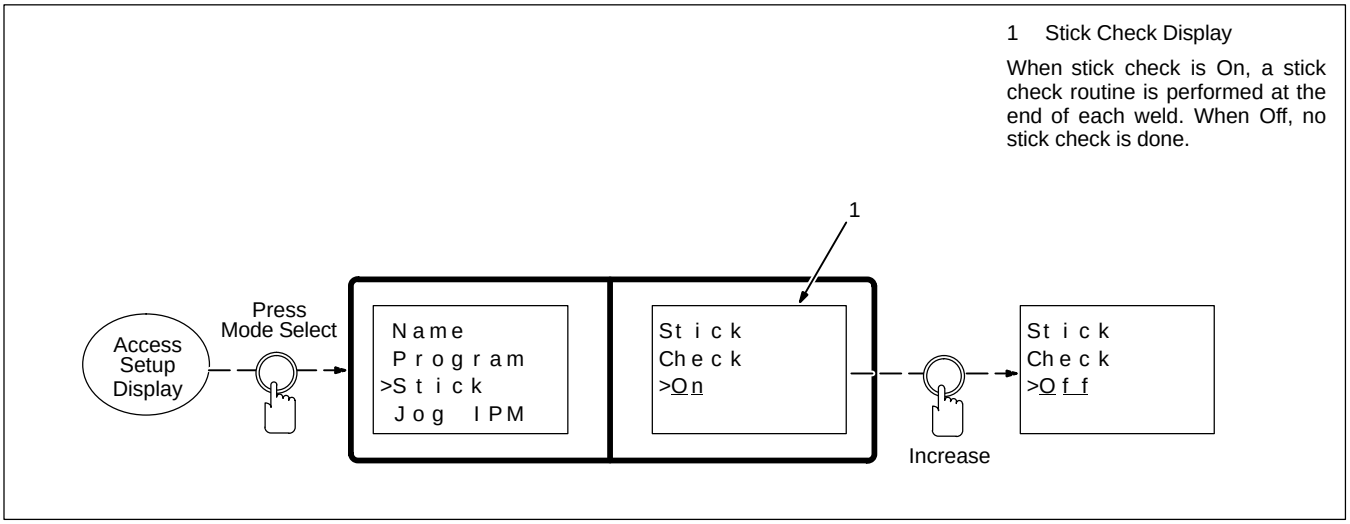

1 Name Display
When a data card is used, the programs written from the unit to the card can be named.
1
Access Setup Display
Press Mode Select
Memory Shutdown >Name Program
Card Programs >On
Increase
Card Programs >Off

10-18.Remote Program Select

NOTE ☞ *Remote Program Select is in binary code, with "A" the least significant bit, and "C" the most significant bit.*


1 Program Display
When Program is On, a remote device may be used to select programs. When Off, program selection must be done from robot Teach Pendant or interface pulse panel.
1
Access Setup Display
Press Mode Select
Shutdown Name >Program Stick
Remote Program >Off
Increase
Remote Program >On

10-19.Stick Check Selection

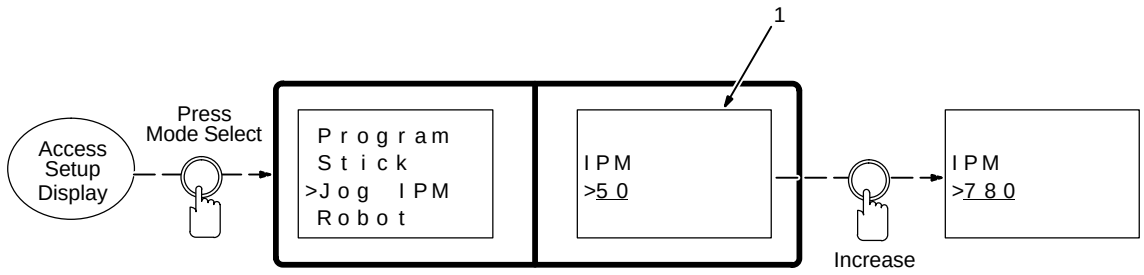

1 Stick Check Display
When stick check is On, a stick check routine is performed at the end of each weld. When Off, no stick check is done.
1
Access Setup Display
Press Mode Select
Name Program >Stick Jog IPM
Stick Check >On
Increase
Stick Check >Off

10-20.Jog Wire Feed Speed Selection

This feature is only used with arc-On style robots.

1 Jog IPM Display

Jog wire feed speed can be varied between 50 and 780 inches per minute, IPM.



10-21.Robot Type Selection

1 Robot Type Display

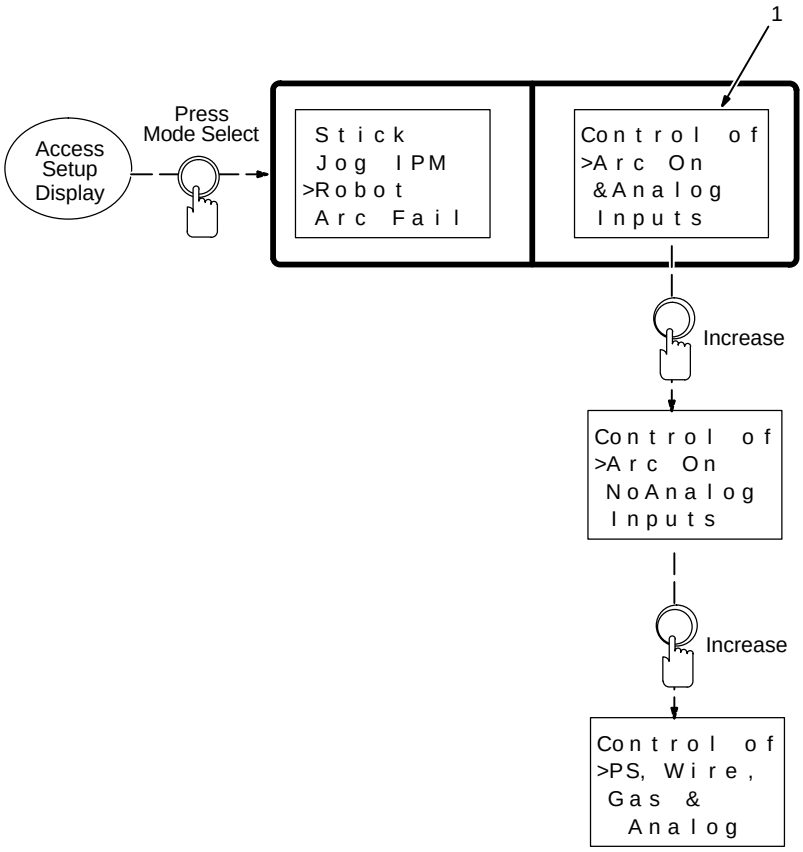
This interface can be programmed to work with three different types of robot controllers.

The robot has control of arc on but the interface has control of weld sequences. There are two analog channel for the robot to use.

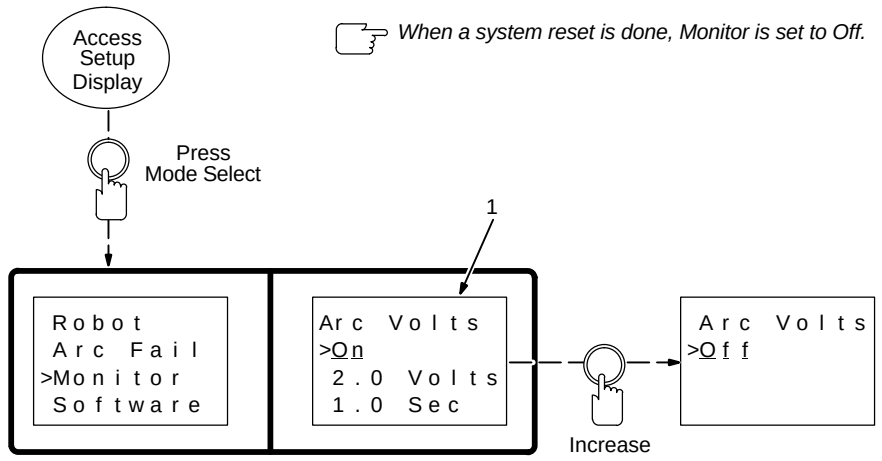
The robot has control of arc on but the interface has control of weld sequences. There are no analog channels for the robot to use.

The robot has control of arc on, the welding power source contactor, wire feed speed, gas valve and two analog channels.

The setting of robot type affects the programming capabilities of the interface. See Sections 6 and 8.



10-22. Arc Voltage Error Selection



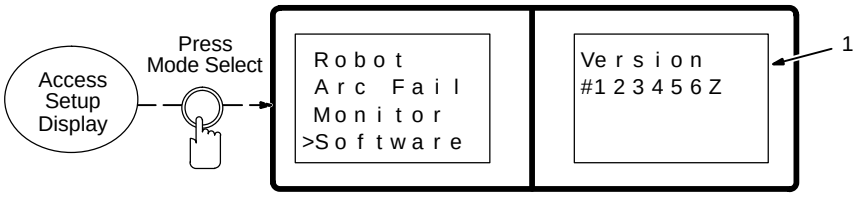
1 Monitor Display

Provides a means to enable/disable the arc voltage error feature and to set an acceptable range of deviation from set arc voltage or arc length (trim) before the error will actuate.

When this feature is off, arc voltage or arc length variations will not cause an error or shut the unit down.

When this feature is on and a range of deviation is set (±0.1 – 9.9 volts from desired weld voltage), arc voltage or arc length variations outside of the range for a period of time longer than that set by the Arc Error timer, causes either the error relay to energize or the unit to shut down depending on the Arc Start/Volt Sense shutdown error setting.

10-23. Software Version Number



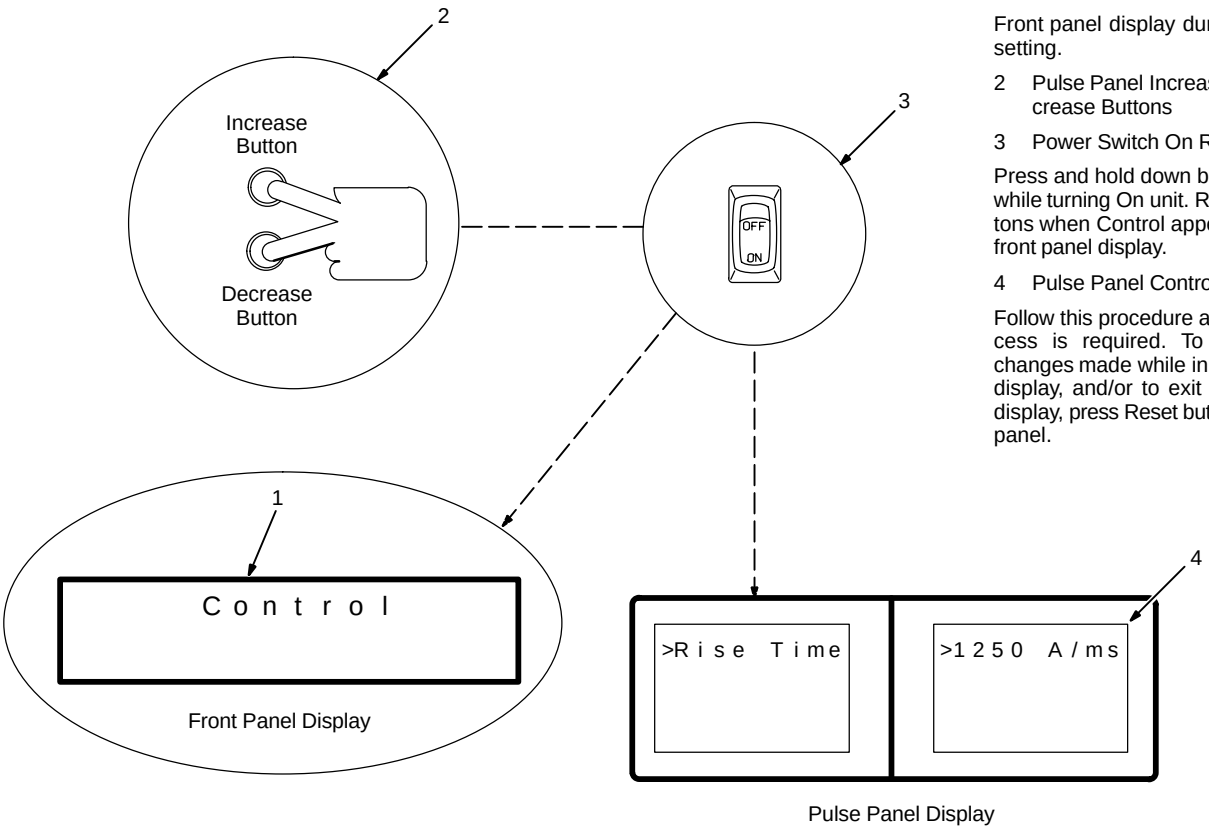
1 Example Version Number Display

When talking with service personnel, this number may be required. (Check actual unit display for number.) The factory keeps this number on file with the serial number of the unit.

SECTION 11 – CONTROL MENU

The control menu allows the user access to rise time setting that controls rise and fall time of the pulse square wave. Changing the rise time setting changes the square wave shape by rounding off the corners, and makes it possible to quiet the pulse arc by just changing the rise time.

11-1. Using Menu Display



1 Front Panel Control Display

Front panel display during control setting.

2 Pulse Panel Increase And Decrease Buttons

3 Power Switch On Rear Panel

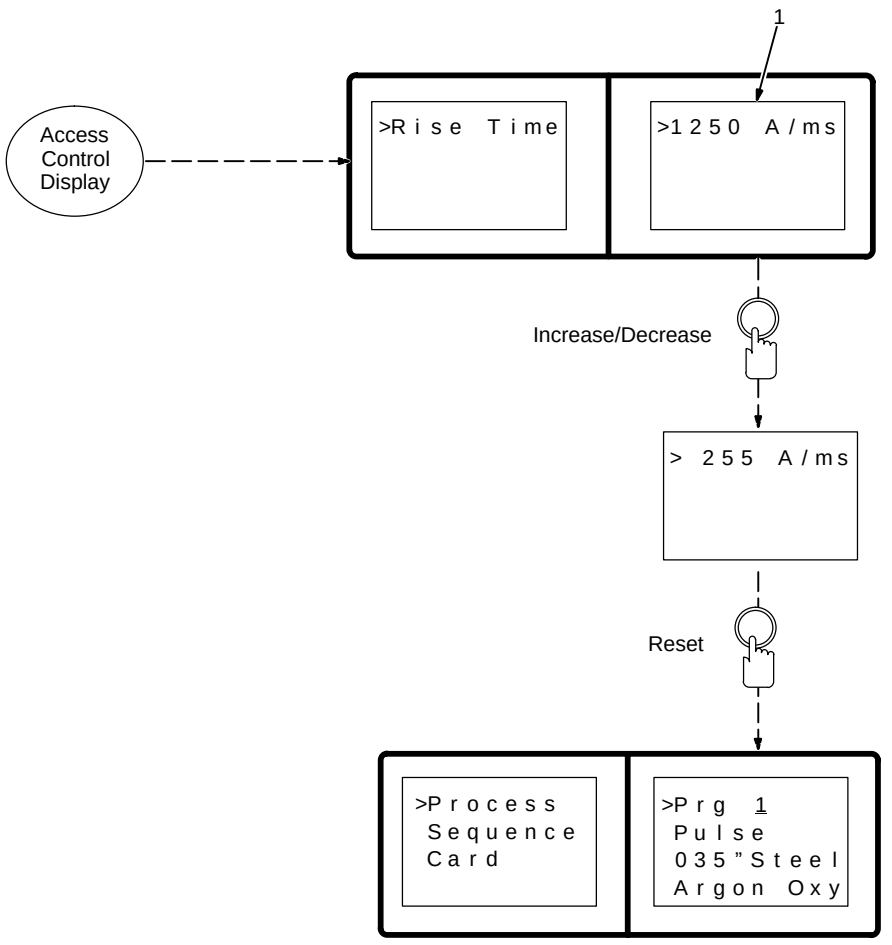
Press and hold down both buttons while turning On unit. Release buttons when Control appears on the front panel display.

4 Pulse Panel Control Display

Follow this procedure any time access is required. To save any changes made while in the control display, and/or to exit the control display, press Reset button on front panel.

11-2. Setting Rise Time

NOTE ☞ *Maximum Rise Time setting will make the welding power source go to its maximum output.*


1
Access Control Display
>R i s e T i m e
>1 2 5 0 A / m s
Increase/Decrease
> 2 5 5 A / m s
Reset
>P r o c e s s
Sequence
Card
>P r g 1
P u l s e
0 3 5 ” S t e e l
A r g o n O x y

1 Rise Time Display

Setting is depend on desired arc characteristics. Make a sample weld after each setting until desired arc characteristics are obtained.

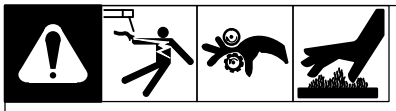
Use Increase or decrease button to change setting.

Range is 250 to 1250 A/ms.

Press Reset button to save setting and exit Control menu.

SECTION 12 – MAINTENANCE & TROUBLESHOOTING

12-1. Routine Maintenance

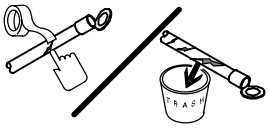


Turn Off all power before maintaining.

3 Months

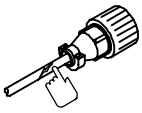
Replace Unreadable Labels

3 Months



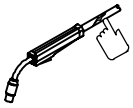
Tape Or Replace Cracked Weld Cable

Replace Cracked Parts



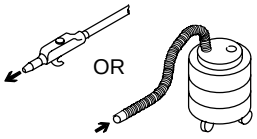
14-Pin Cord

Gas Hose



Gun Cable

6 Months

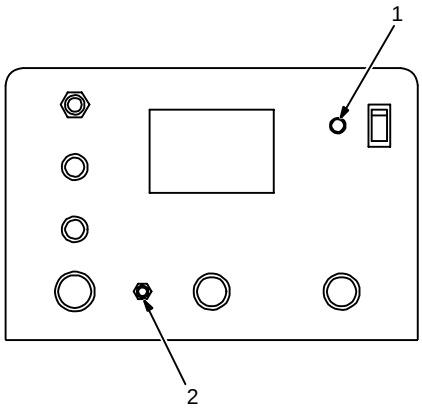


OR

Blow Out Or Vacuum Inside

During Heavy Service, Clean Monthly

12-2. Overload Protection



Turn Off robot, interface, and welding power source.

1 Circuit Breaker CB1

CB1 protects the interface from overload. If CB1 trips, the unit shuts down.

Allow cooling period and manually reset breaker.

2 Fuse F1

F1 protects the interface from overload. If F1 opens, the unit shuts down.

Replace F1 with fuse of the same type, size, and rating.

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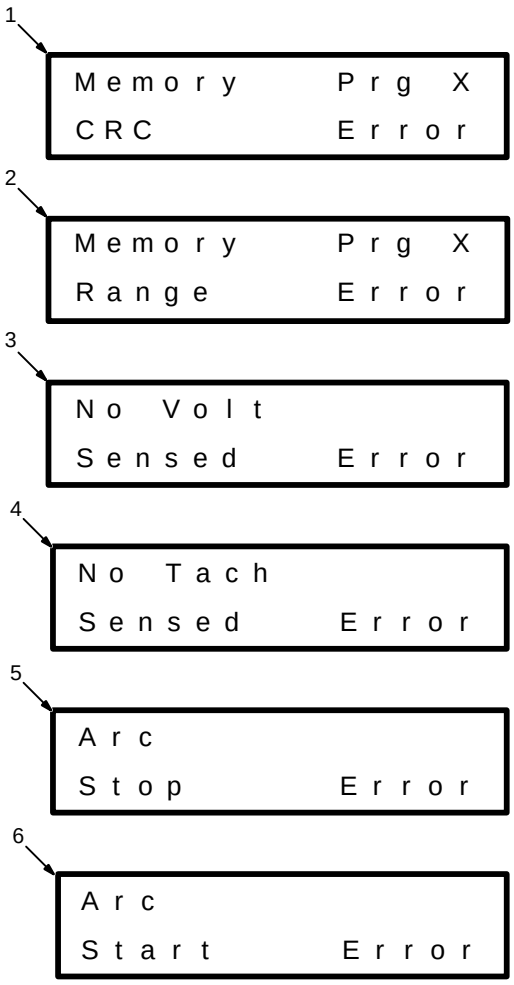
12-3. Front Panel Error Displays



1 Memory CRC Error Display

Corrupted program data has been detected or loaded. The “X” value indicates the program number.

May be caused by incompatible information on the data card or bad memory.

2 Memory Range Error Display

Improper welding power source range is selected. The “X” value indicates the program number.

May be caused by improper range settings or improper data loaded into the interface unit.

3 No Volt Sensed Error Display

The arc voltage sense circuit did not receive feedback within the required time after an arc was established.

May be caused by an inability to establish an arc in the pulse schedule, or a lack of voltage feedback.

4 No Tach Sensed Error Display

The motor tachometer feedback is not reaching the control.

May be caused by obstructions in the wire feed system or a faulty wire drive system.

5 Arc Stop Error Display

Trouble is occurring at arc end.

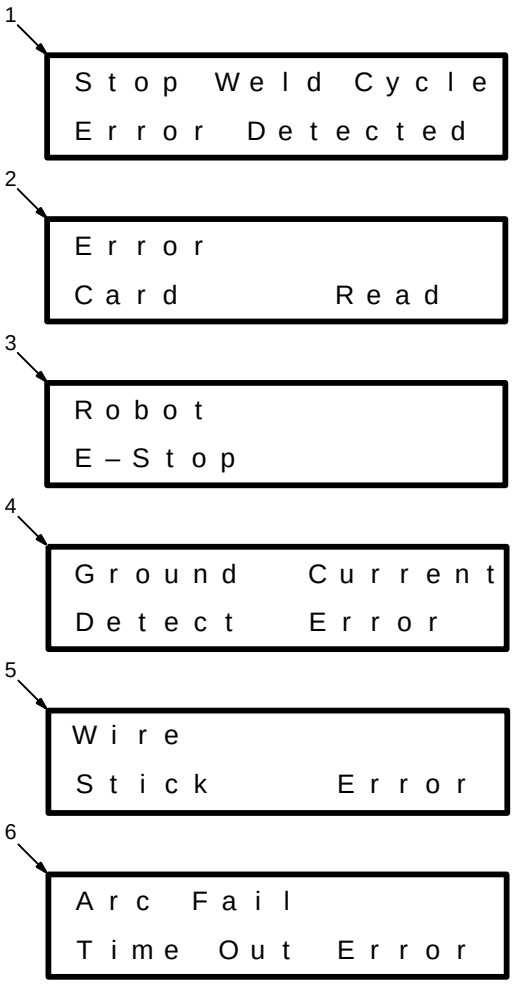
May be caused by obstructions in the wire feed system or a faulty wire drive system.

6 Arc Start Error Display

Trouble is occurring at arc start.

May be caused by obstructions in the wire feed system or a faulty wire drive system.

12-4. Error Displays (Continued)



1 Stop Weld Cycle Error Display

An error has been detected and the robot hasn't stopped the weld cycle, causing the interface unit to stop the weld cycle and wait for the robot to stop.

2 Error Card Read Display

The card reader is not working properly.

May be caused by a bad data card, a bad data card reader, a faulty microprocessor circuit board, or a wiring problem.

3 Robot E-Stop Display

The robot E-Stop is active. The interface unit will remain in a locked stated until the E-Stop is released.

4 Ground Current Detect Error Display

Weld current has been detected in the earth ground connection.

May be caused by a conductor making connection to the unit chassis.

5 Wire Stick Error Display

The welding wire has stuck to the workpiece at the end of the weld.

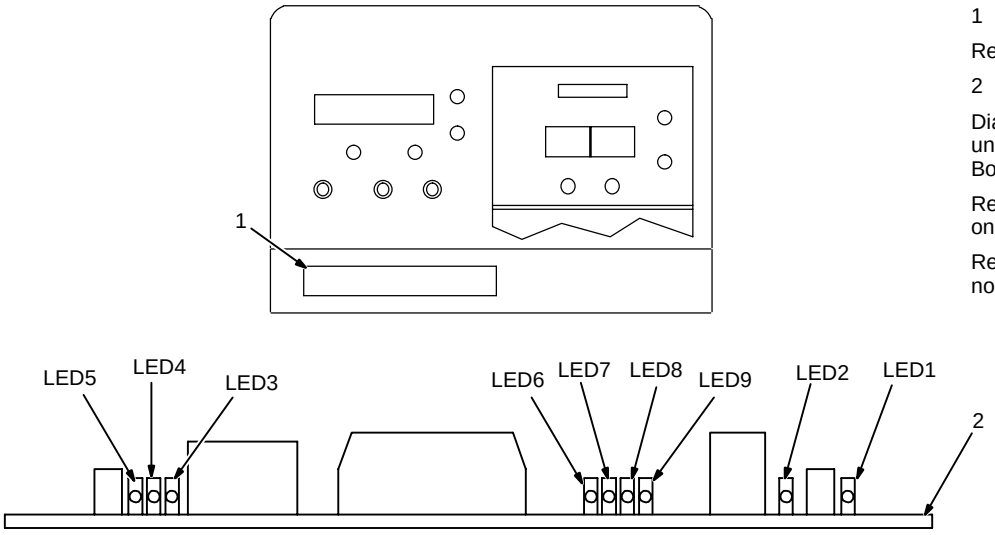
May be caused by poor weld conditions.

6 Arc Fail Time Out Error Display

An arc was not established within the allotted time.

May be caused by an inoperable wire drive, absence of shield gas, or improperly operating welding power source.

12-5. Interface Board PC5 Diagnostic LED's



1 Diagnostic LED's Cover

Remove cover.

2 Interface Board PC5

Diagnostic LED's are visible inside unit, located on edge of Interface Board PC5 facing front of unit.

Refer to Section 12-6 for information on diagnostic LED's.

Reinstall cover after checking diagnostic LED's.

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12-6. Diagnostic LED's On Interface Board PC5

LED	Status	Diagnosis
1	On	Indicates +15 volts dc present on interface board PC5 with respect to power source common.
	Off	If LED 1 is off and LED's 2 thru 5 are on, replace interface board PC5. If LED 1 is off and LED's 2 thru 5 are off, check Power switch S1, integrated rectifier SR1, and motor board PC3. Replace S1, SR1, and PC1 if necessary.
2	On	Indicates –15 volts dc present on interface board PC5 with respect to power source common.
	Off	If LED 2 is off and LED's 1, 3, 4, and 5 are on, replace interface board PC5. If LED 2 is off and LED's 1, 3, 4, and 5 are off, check Power switch S1, integrated rectifier SR1, and motor board PC3. Replace S1, SR1, and PC1 if necessary.
3	On	Indicates +15 volts dc present on interface board PC5 with respect to dc circuit common.
	Off	If LED 3 is off and LED's 1, 2, 4, and 5 are on, replace interface board PC5. If LED 3 is off and LED's 1, 2, 4, and 5 are off, check Power switch S1, integrated rectifier SR1, and motor board PC3. Replace S1, SR1, and PC1 if necessary.
4	On	Indicates –15 volts dc present on interface board PC5 with respect to dc circuit common.
	Off	If LED 4 is off and LED's 1, 2, 3, and 5 are on, replace interface board PC5. If LED 4 is off and LED's 1, 2, 3, and 5 are off, check Power switch S1, integrated rectifier SR1, and motor board PC3. Replace S1, SR1, and PC1 if necessary.
5	On	Indicates +5 volts dc present on interface board PC5 with respect to dc circuit common.
	Off	If LED 5 is off and LED's 1 thru 4 are on, replace interface board PC5. If LED 5 is off and LED's 1 thru 4 are off, check Power switch S1, integrated rectifier SR1, and motor board PC3. Replace S1, SR1, and PC1 if necessary.
6	On	Indicates contactor is not energized, normal standby mode.
	Off	Indicates contactor is energized.
7	On	Indicates CV mode is selected.
	Off	Indicates CC mode is selected.
8	On	Indicates gas valve GS1 is not energized, normal standby mode.
	Off	Indicates gas valve GS1 is energized.
9	On	Indicates wire feed motor M1 is not running, normal standby mode.
	Off	Indicates wire feed motor M1 is running.

12-7. Customer Interface Board PC4 Diagnostic LED's

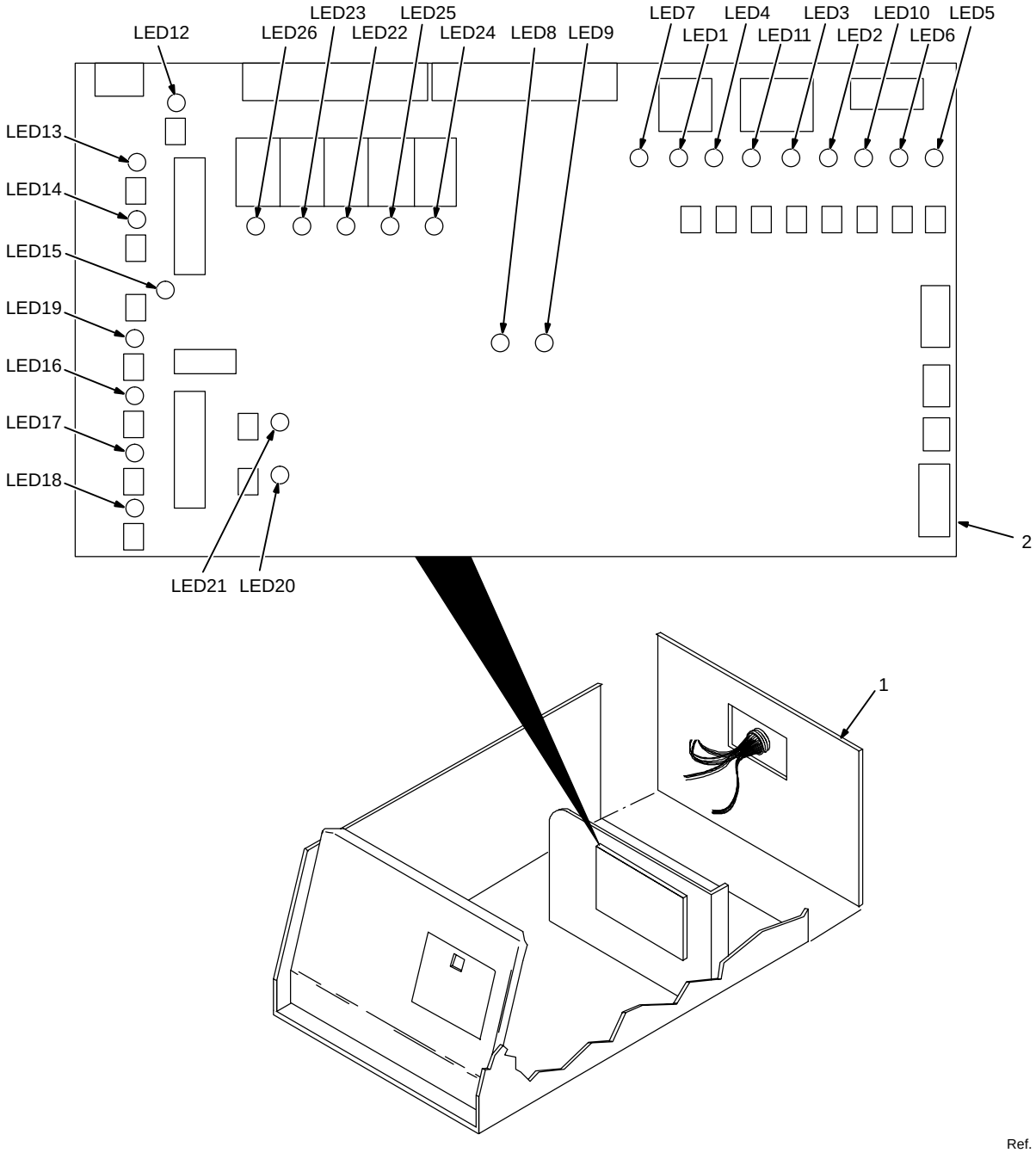
1 Robotic Interface II

2 Customer Interface Board PC4

Diagnostic LED's are visible inside unit, located on PC4 mounted to center panel facing front of unit.

Refer to Section 12-8 for information on diagnostic LED's.

Reinstall top cover after checking diagnostic LED's.



Ref. ST-801 124-B

12-8. Diagnostic LED's On Interface Board PC4

LED	Status	Diagnosis
1	On	Input signal On for RPS8-A.
	Off	Input signal Off for RPS8-A.
2	On	Input signal On from robot for shielding gas valve.
	Off	Input signal Off from robot for shielding gas valve.
3	On	Input signal On for welding power source contactor.
	Off	Input signal Off for welding power source contactor.
4	On	Input signal On for RPS8-C.
	Off	Input signal Off for RPS8-C.
5	On	Input signal On for shielding gas purge.
	Off	Input signal Off for shielding gas purge.
6	On	Input signal On for Jog retract.
	Off	Input signal Off for Jog retract.
7	On	Indicates +24 volts dc present on customer interface board PC4 with respect to power source common.
	Off	No +24 volts dc at customer interface board PC4.
8	On	Indicates –15 volts dc present on interface board PC4 with respect to dc circuit common.
	Off	No –15 volts dc at customer interface board PC4.
9	On	Indicates +15 volts dc present on interface board PC4 with respect to dc circuit common.
	Off	No +15 volts dc present at customer interface board PC4.
10	On	Input signal On for Jog advance.
	Off	Input signal Off for Jog advance.
11	On	Input signal On for RPS8-B.
	Off	Input signal Off for RPS8-B.
12 to 21	Not used	
22	On	Output signal On to indicate that wire is stuck.
	Off	Output signal Off indicates wire not stuck.
23	On	Output signal On indicates ABB robot jog signal.
	Off	Output signal Off indicates no ABB robot jog signal.
24	On	Output signal On indicates weld current detected.
	Off	Output signal Off indicates no weld current detected.
25	On	Output signal On indicates an arc failure.
	Off	Output signal Off indicates no arc failure.
26	On	Output signal On indicates welding power source is ready.
	Off	Output signal Off indicates welding power source not ready.

SECTION 13 – ELECTRICAL DIAGRAMS

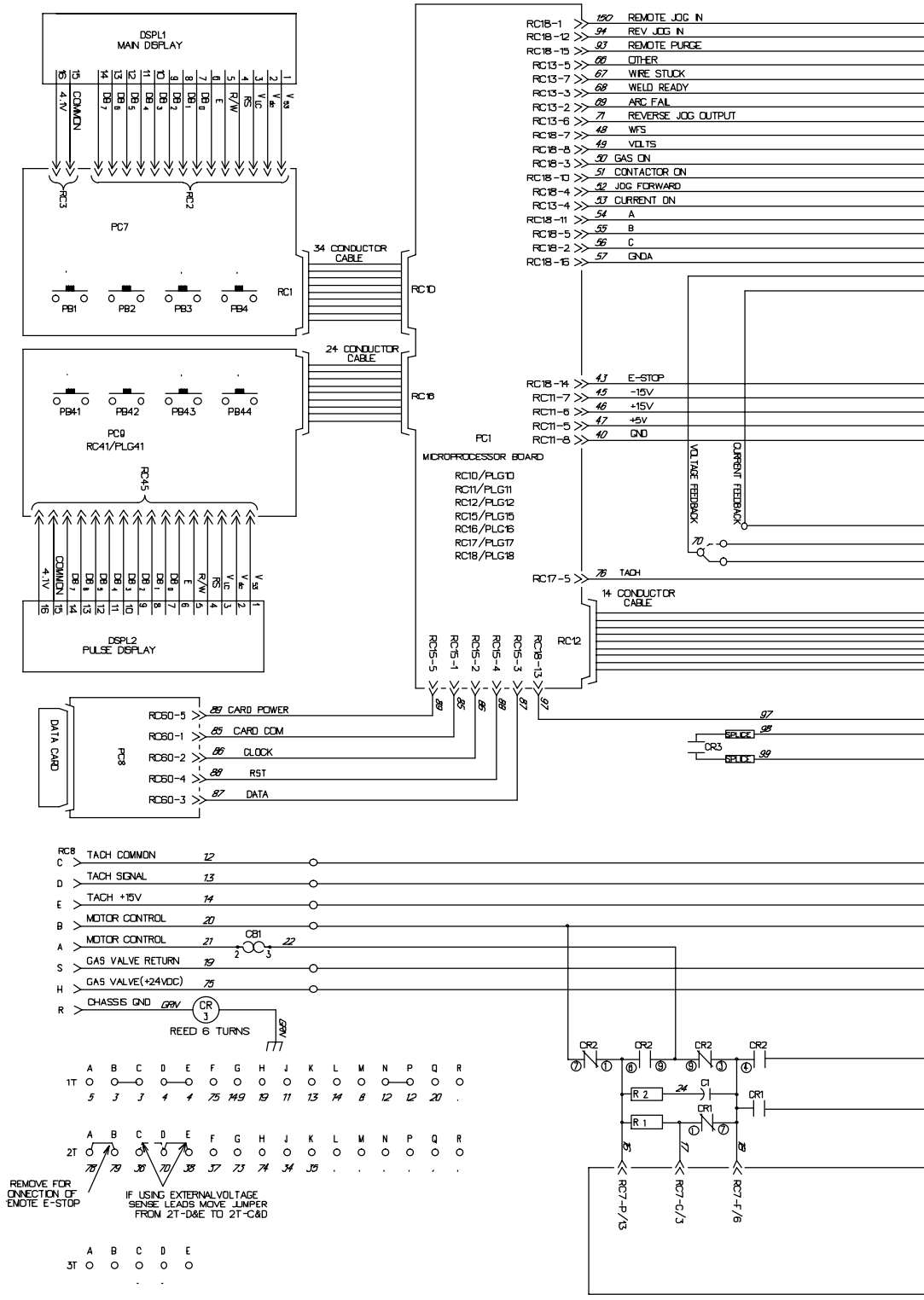
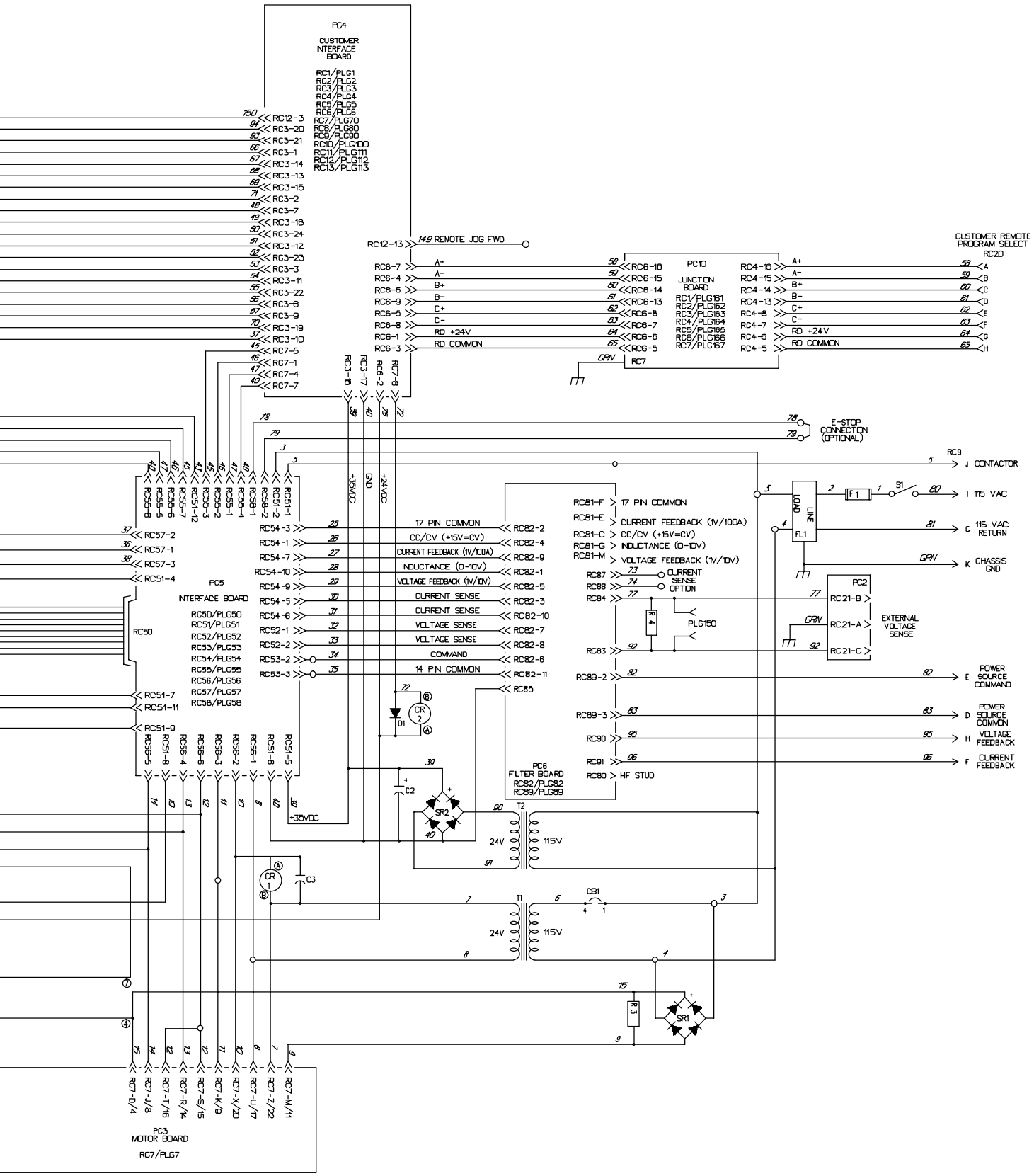


Figure 13-1. Circuit Diagram For Robotic Interface Unit


PC4
CUSTOMER INTERFACE BOARD
RC1/PLG1
RC2/PLG2
RC3/PLG3
RC4/PLG4
RC5/PLG5
RC6/PLG6
RC7/PLG70
RC8/PLG80
RC9/PLG90
RC10/PLG100
RC11/PLG111
RC12/PLG112
RC13/PLG113
RC12-13
149 REMOTE JOG FWD
RC6-7 A+
RC6-4 A-
RC6-6 B+
RC6-9 B-
RC6-5 C+
RC6-8 C-
RC6-1 RD +24V
RC6-3 RD COMMON
PC10
JUNCTION BOARD
RC1/PLG161
RC2/PLG162
RC3/PLG163
RC4/PLG164
RC5/PLG165
RC6/PLG166
RC7/PLG167
RC4-16 A+
RC4-15 A-
RC4-14 B+
RC4-13 B-
RC4-8 C+
RC4-7 C-
RC4-6 RD +24V
RC4-5 RD COMMON
CUSTOMER REMOTE PROGRAM SELECT
RC20
E-STOP CONNECTION (OPTIONAL)
RC9
J CONTACTOR
I 115 VAC
G 115 VAC RETURN
K CHASSIS GND
LOAD
LINE
FL1
F1
S1
PC2
RC21-B
RC21-A
RC21-C
EXTERNAL VOLTAGE SENSE
PC5
INTERFACE BOARD
RC50/PLG50
RC51/PLG51
RC52/PLG52
RC53/PLG53
RC54/PLG54
RC55/PLG55
RC56/PLG56
RC57/PLG57
RC58/PLG58
RC50
RC54-3 17 PIN COMMON
RC54-1 CC/CV (+15V=CV)
RC54-7 CURRENT FEEDBACK (1V/100A)
RC54-10 INDUCTANCE (0-10V)
RC54-9 VOLTAGE FEEDBACK (1V/10V)
RC54-5 CURRENT SENSE
RC54-6 CURRENT SENSE
RC52-1 VOLTAGE SENSE
RC52-2 VOLTAGE SENSE
RC53-2 COMMAND
RC53-3 14 PIN COMMON
RC82-2
RC82-4
RC82-9
RC82-1
RC82-5
RC82-3
RC82-10
RC82-7
RC82-8
RC82-6
RC82-11
RC85
RC81-F 17 PIN COMMON
RC81-E CURRENT FEEDBACK (1V/100A)
RC81-C CC/CV (+15V=CV)
RC81-G INDUCTANCE (0-10V)
RC81-M VOLTAGE FEEDBACK (1V/10V)
RC87 CURRENT SENSE OPTION
RC88
RC84
PLG150
RC83
RC89-2
RC89-3
RC90
RC91
RC80 HF STUD
PC6
FILTER BOARD
RC82/PLG82
RC89/PLG89
POWER SOURCE COMMAND
POWER SOURCE COMMON
VOLTAGE FEEDBACK
CURRENT FEEDBACK
+35VDC
GND
+24VDC
CR1
CR2
D1
C2
C3
SR1
SR2
R3
R4
T1
T2
24V
115V
CB1
RC7-D/4
RC7-J/8
RC7-T/16
RC7-R/14
RC7-S/15
RC7-K/9
RC7-X/20
RC7-U/17
RC7-Z/22
RC7-M/11
PC3
MOTOR BOARD
RC7/PLG7

SD-185 806

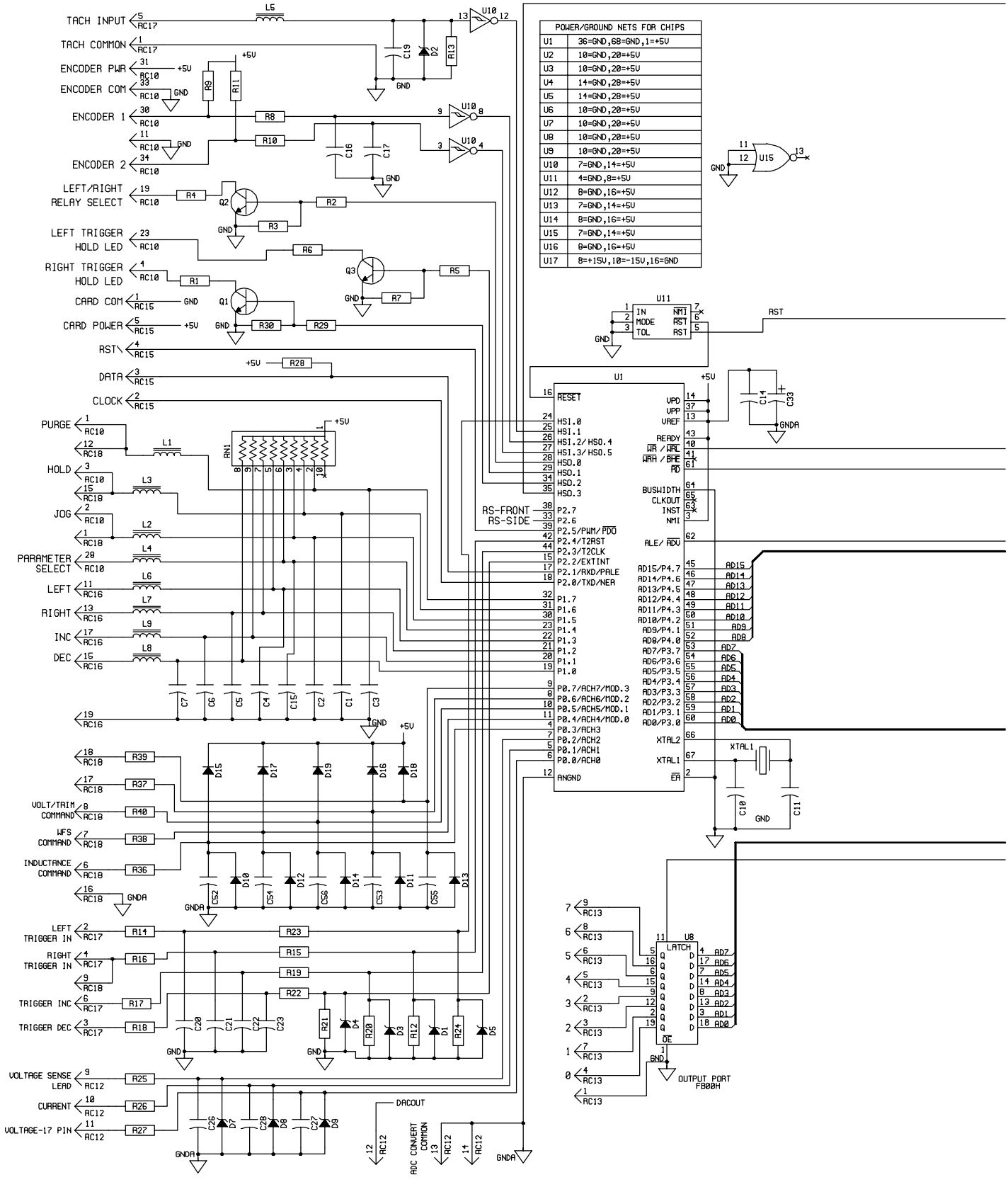
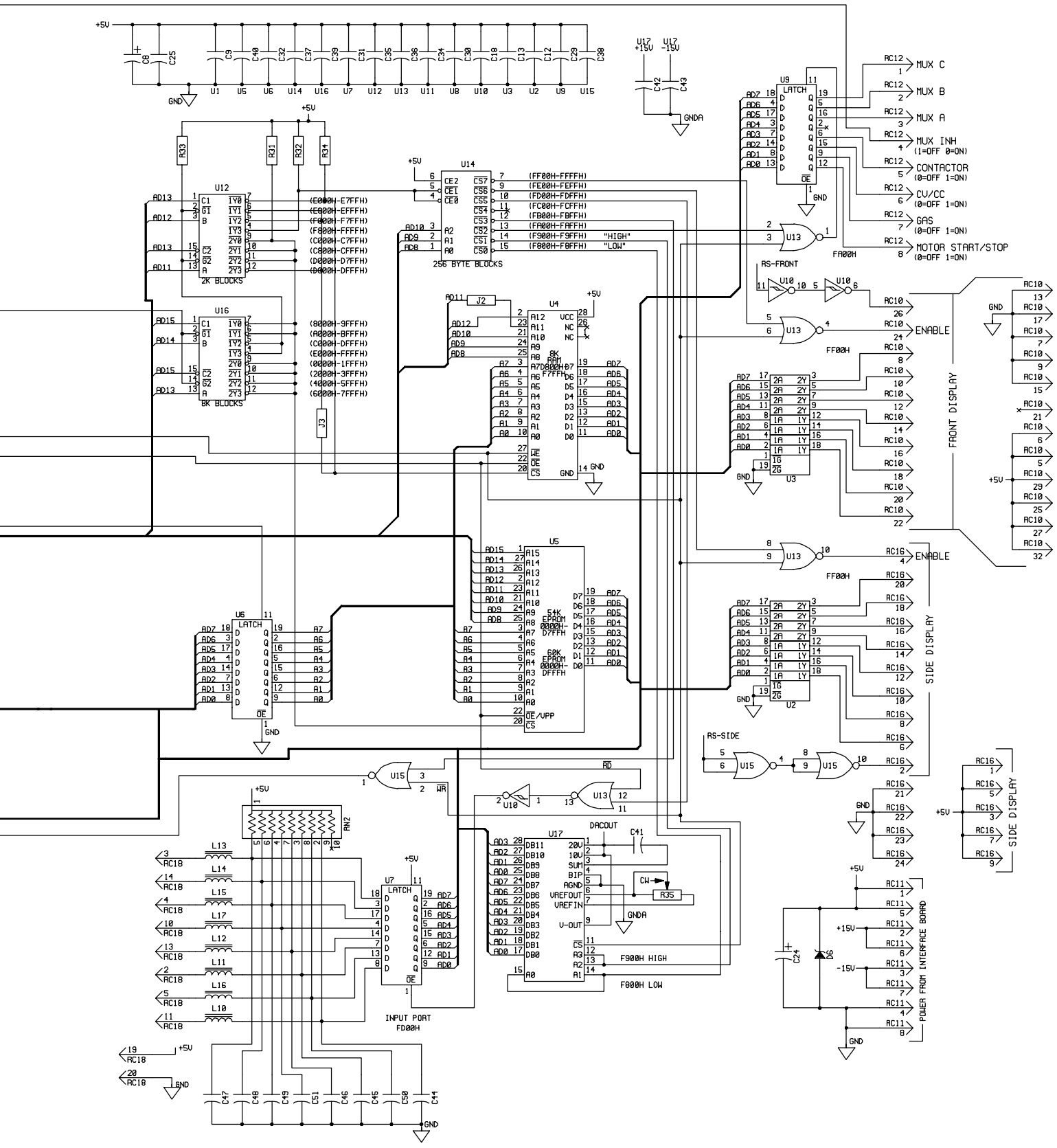


Figure 13-2. Circuit Diagram For Microprocessor Board PC1


MUX C
MUX B
MUX A
MUX INH
(1=OFF 0=ON)
CONTACTOR
(0=OFF 1=ON)
CV/CC
(0=OFF 1=ON)
GAS
(0=OFF 1=ON)
MOTOR START/STOP
(0=OFF 1=ON)
ENABLE
FRONT DISPLAY
SIDE DISPLAY
POWER FROM INTERFACE BOARD
INPUT PORT
FD00H
F900H HIGH
F800H LOW
256 BYTE BLOCKS
2K BLOCKS
8K BLOCKS
54K EPROM
60K EPROM
8K RAM
LATCH
DACOUT
RS-FRONT
RS-SIDE
+5V
+15V
-15V
GND
GNDA

SD-161 039-A

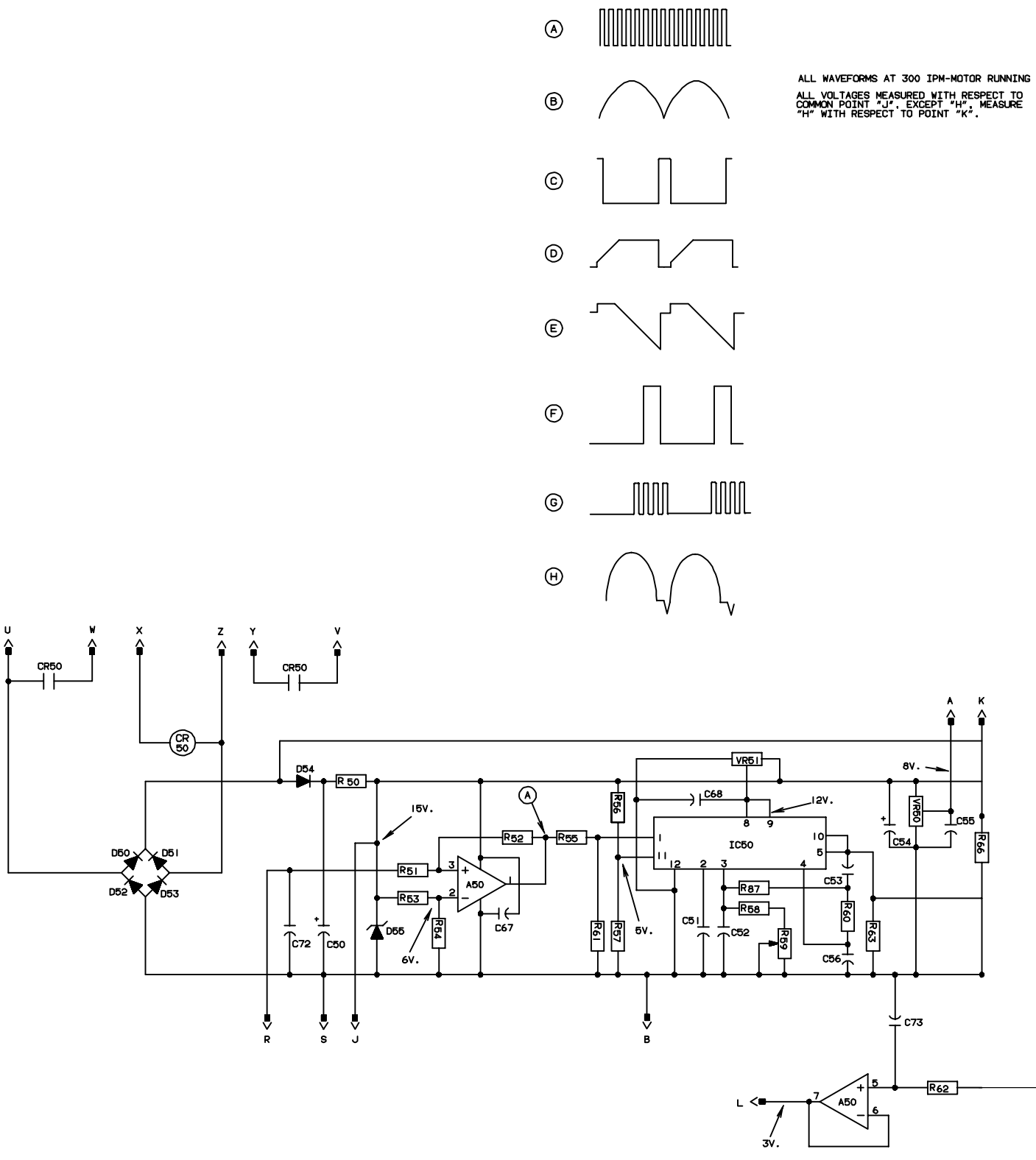
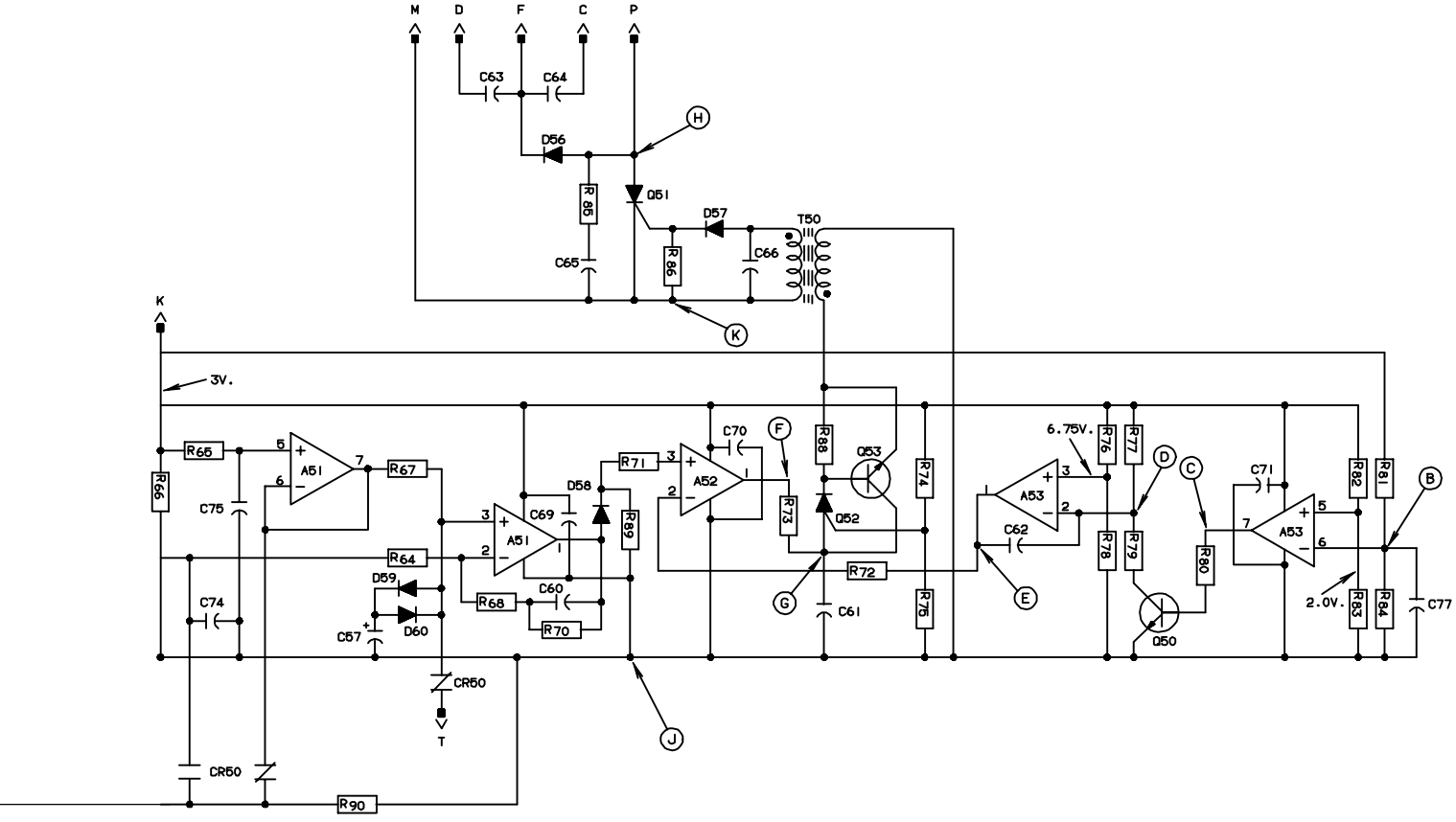


Figure 13-3. Circuit Diagram For Motor Board PC3


M
D
F
C
P
C63
C64
D56
H
R85
Q51
D57
T50
C65
R86
C66
K
K
3V.
R65
A51
R67
C75
R64
C74
D59
D60
C57
R68
C69
D58
R86
C60
R70
R71
A52
C70
F
R88
Q53
R73
Q52
R72
G
C61
R74
R75
J
CR50
T
CR50
R90
6.75V.
R76
R77
A53
C62
R78
R79
D
C
R80
Q50
C71
A53
R82
R81
B
2.0V.
R83
R84
C77

SD-083 388-B

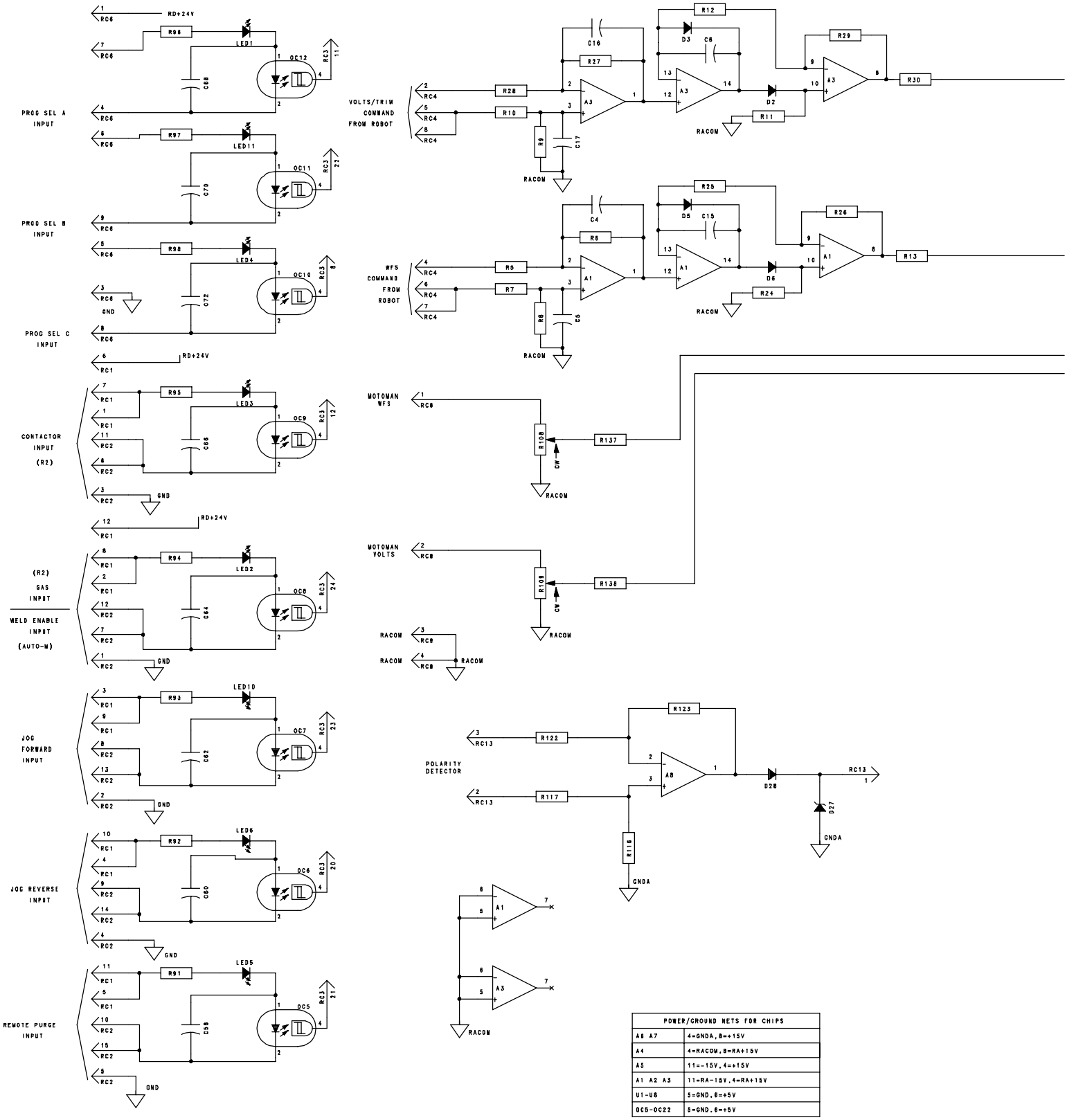
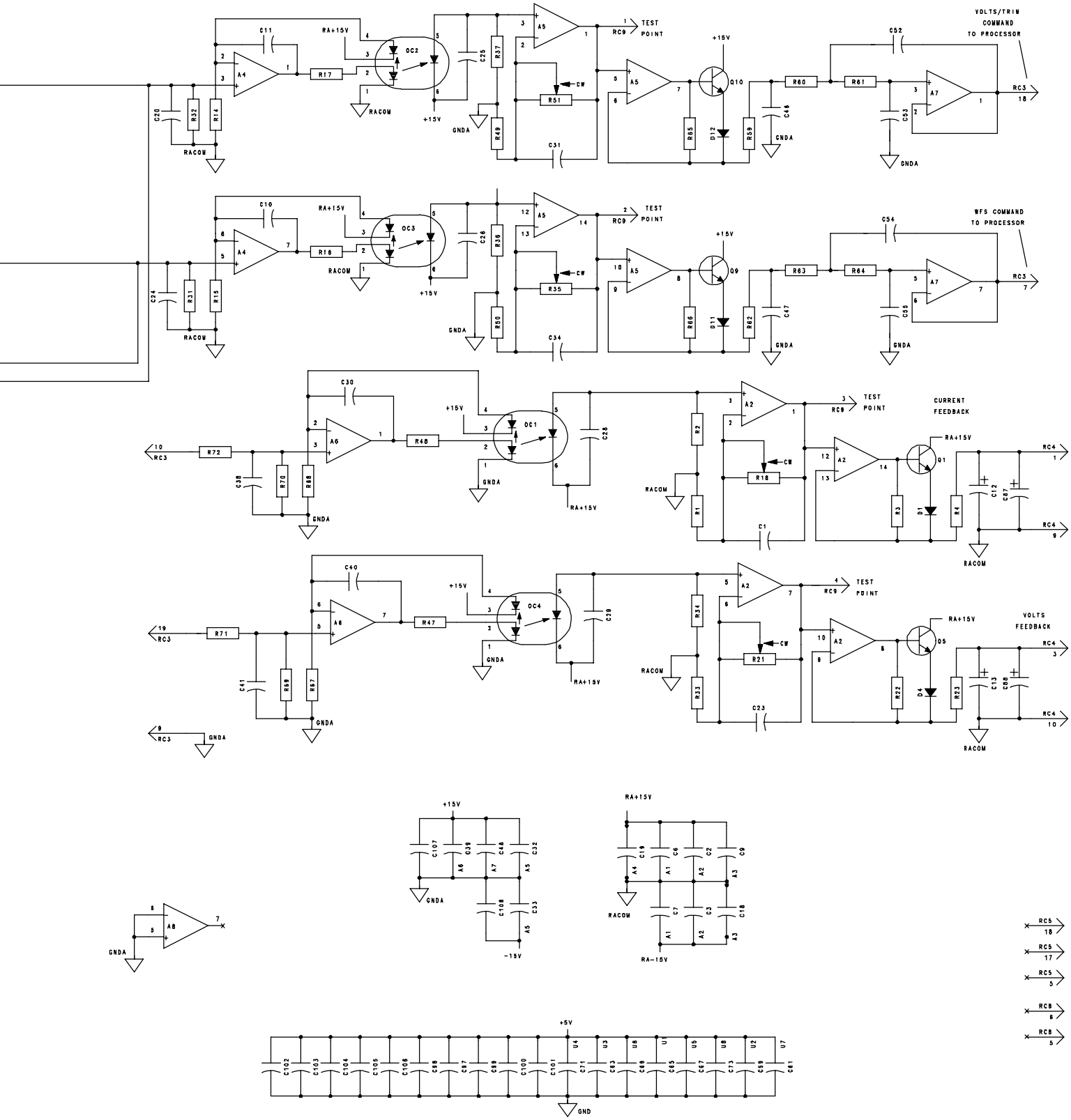


Figure 13-4. Circuit Diagram For Customer Interface Board PC4 (Part 1 of 2)


VOLTS/TRIM
COMMAND
TO PROCESSOR
WFS COMMAND
TO PROCESSOR
CURRENT
FEEDBACK
VOLTS
FEEDBACK
TEST
POINT
RA+15V
RACOM
GNDA
+15V
-15V
+5V
GND
CW

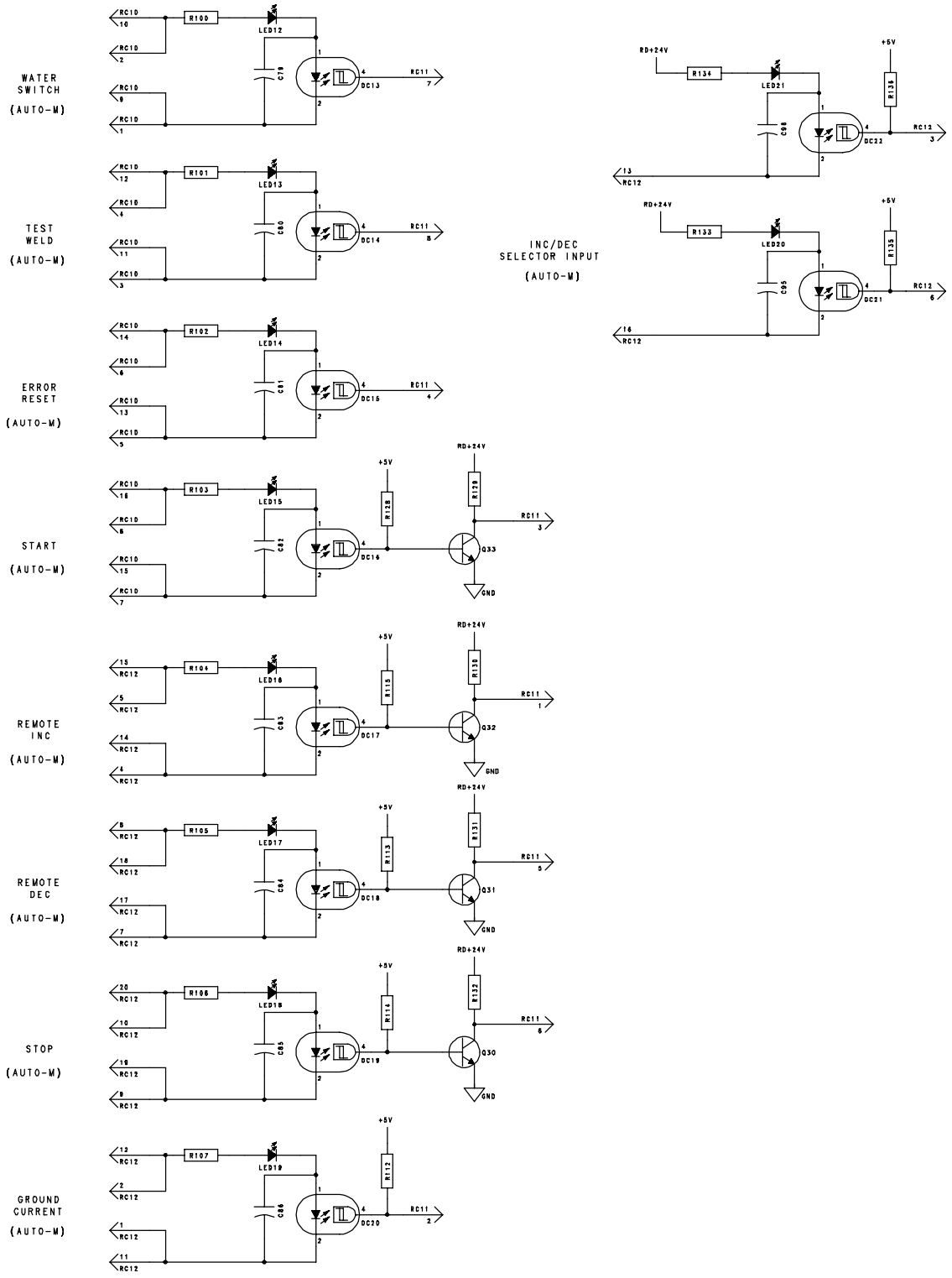
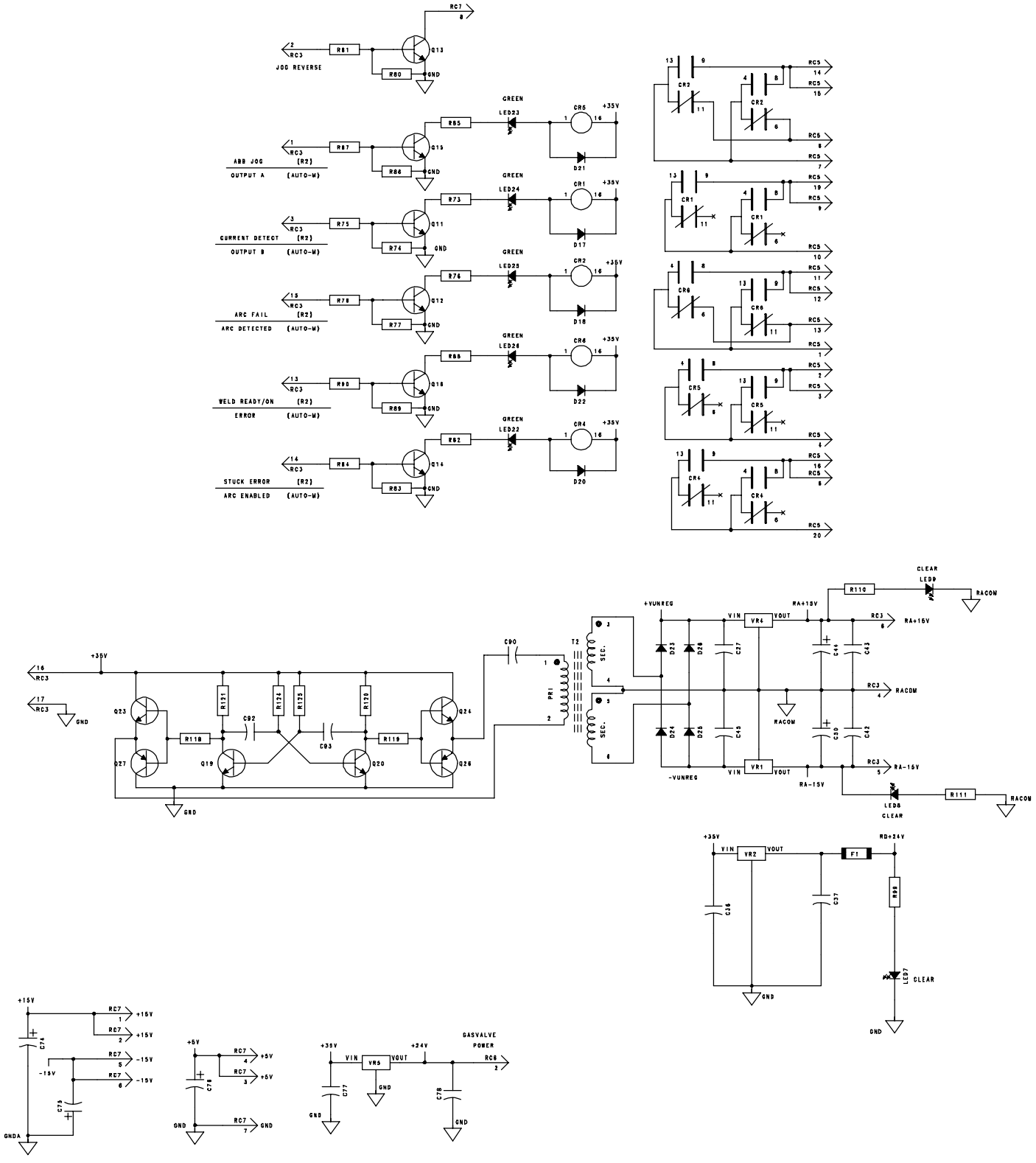


Figure 13-5. Circuit Diagram For Customer Interface Board PC4 (Part 2 of 2)



SD-180 191 (Part 2 of 2)

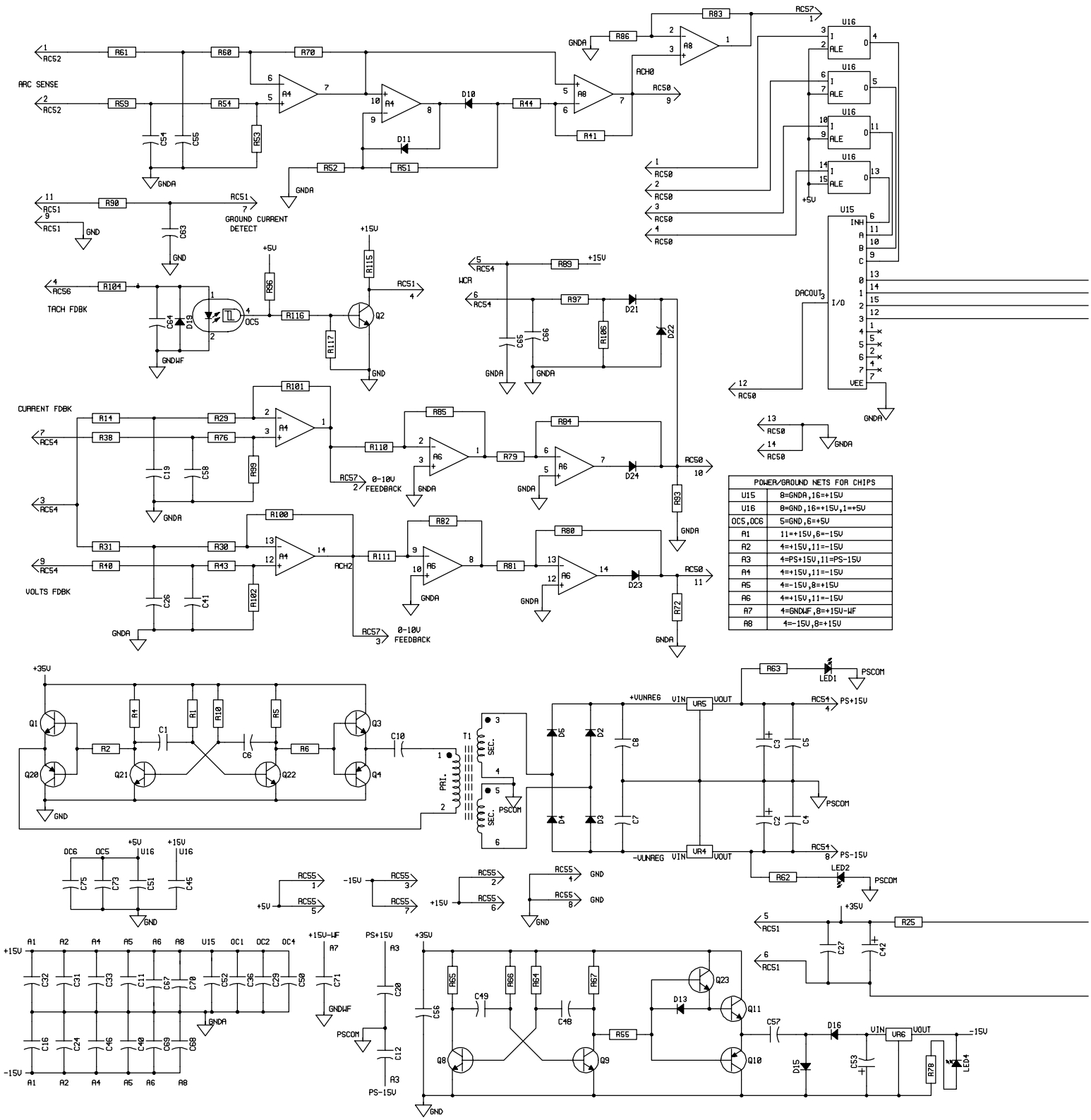
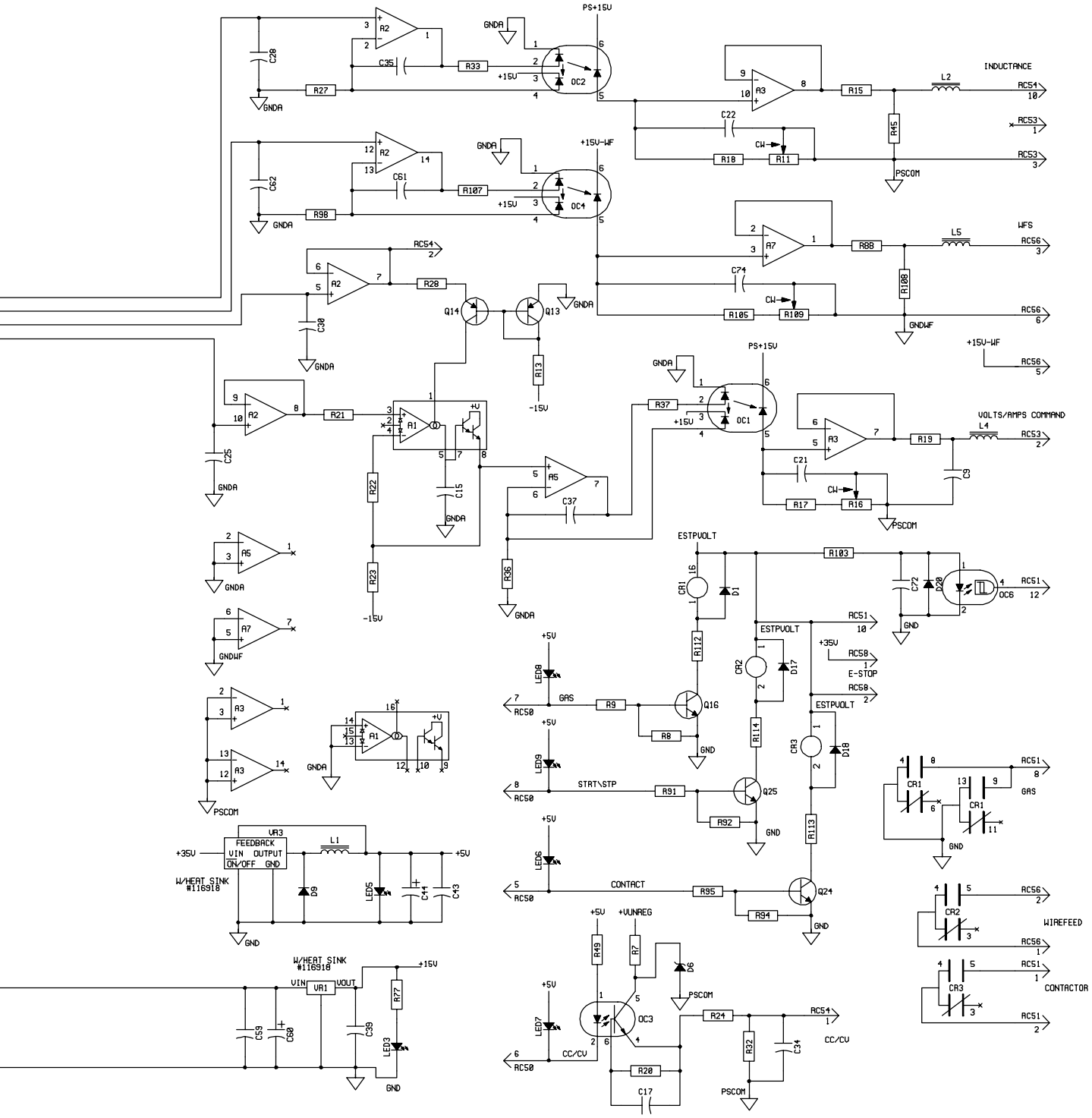


Figure 13-6. Circuit Diagram For Interface Board PC5


PS+15V
GNDA
A2
C28
C35
R33
OC2
R27
+15V
A3
R15
L2
INDUCTANCE
RC51
10
RC53
1
RC53
3
C22
CW
R18
R11
R45
PSCOM
+15V-WF
C62
C61
R107
R98
OC4
A7
R88
L5
WFS
RC56
3
C74
R105
R109
R108
GNDWF
RC56
6
RC54
2
R28
Q14
Q13
C30
R13
-15V
+15V-WF
RC56
5
R37
OC1
A5
C37
R36
A1
R21
R22
C15
R23
C25
A3
R19
L4
VOLTS/AMPS COMMAND
RC53
2
C21
C3
R17
R16
ESTPVOLT
R103
CR1
D1
C72
D20
OC6
RC51
12
GND
RC51
10
+35V
RC58
1
E-STOP
RC58
2
ESTPVOLT
CR2
D17
R112
LED8
+5V
GAS
R9
Q16
R8
R114
CR3
D18
LED9
STRT\STP
R91
Q25
R92
R113
LED6
CONTACT
R95
Q24
R94
RC50
VR3
FEEDBACK
VIN OUTPUT
ON/OFF GND
+35V
+5V
L1
W/HEAT SINK
#116918
D9
LED5
C41
C43
CR1
GAS
CR2
WIREFEED
CR3
CONTACTOR
+VUNREG
R49
R7
D6
LED7
OC3
CC/CV
R24
R32
C34
R20
C17
VR1
VIN
VOUT
R77
C59
C58
C39
LED3
+15V

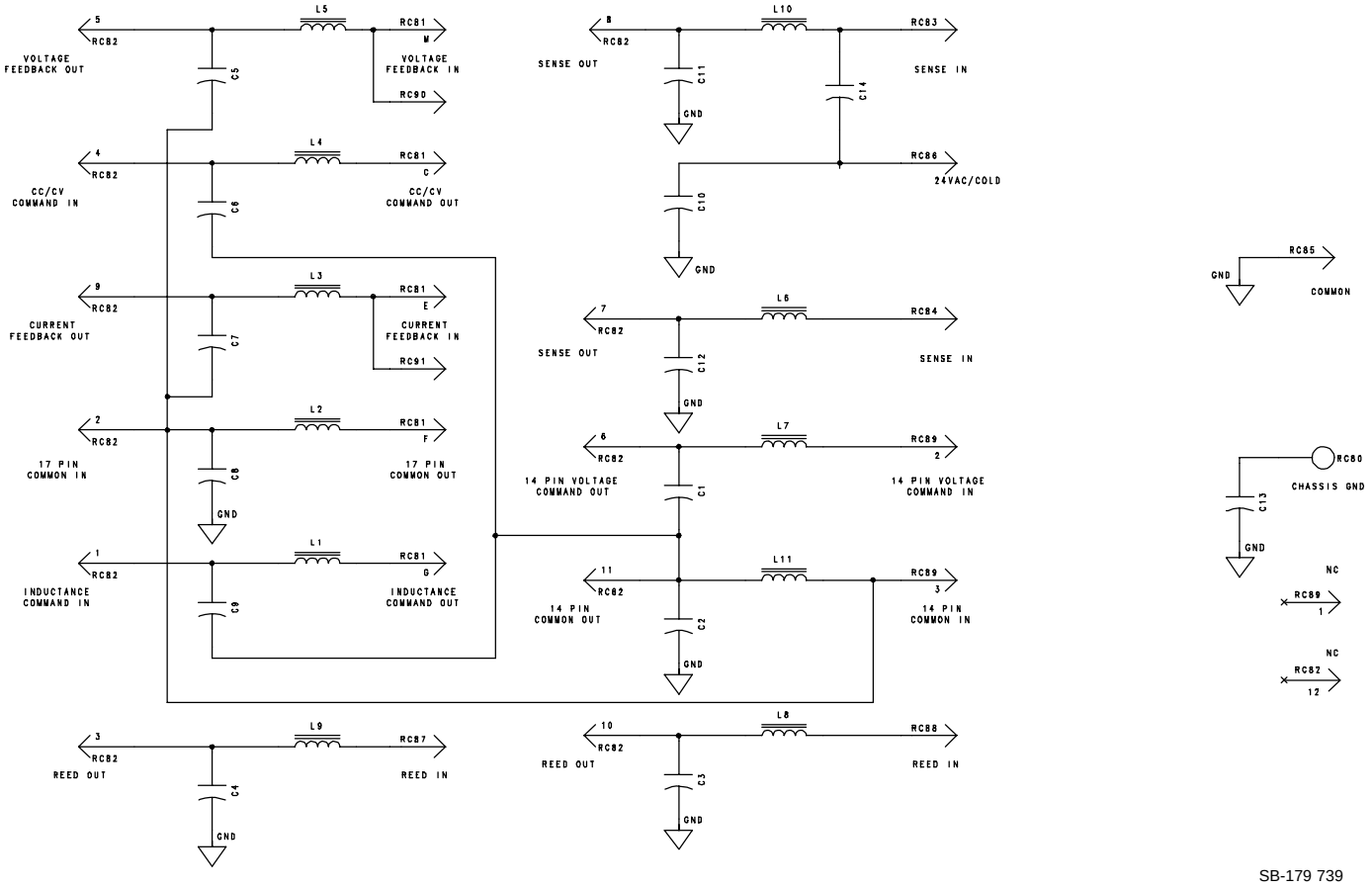
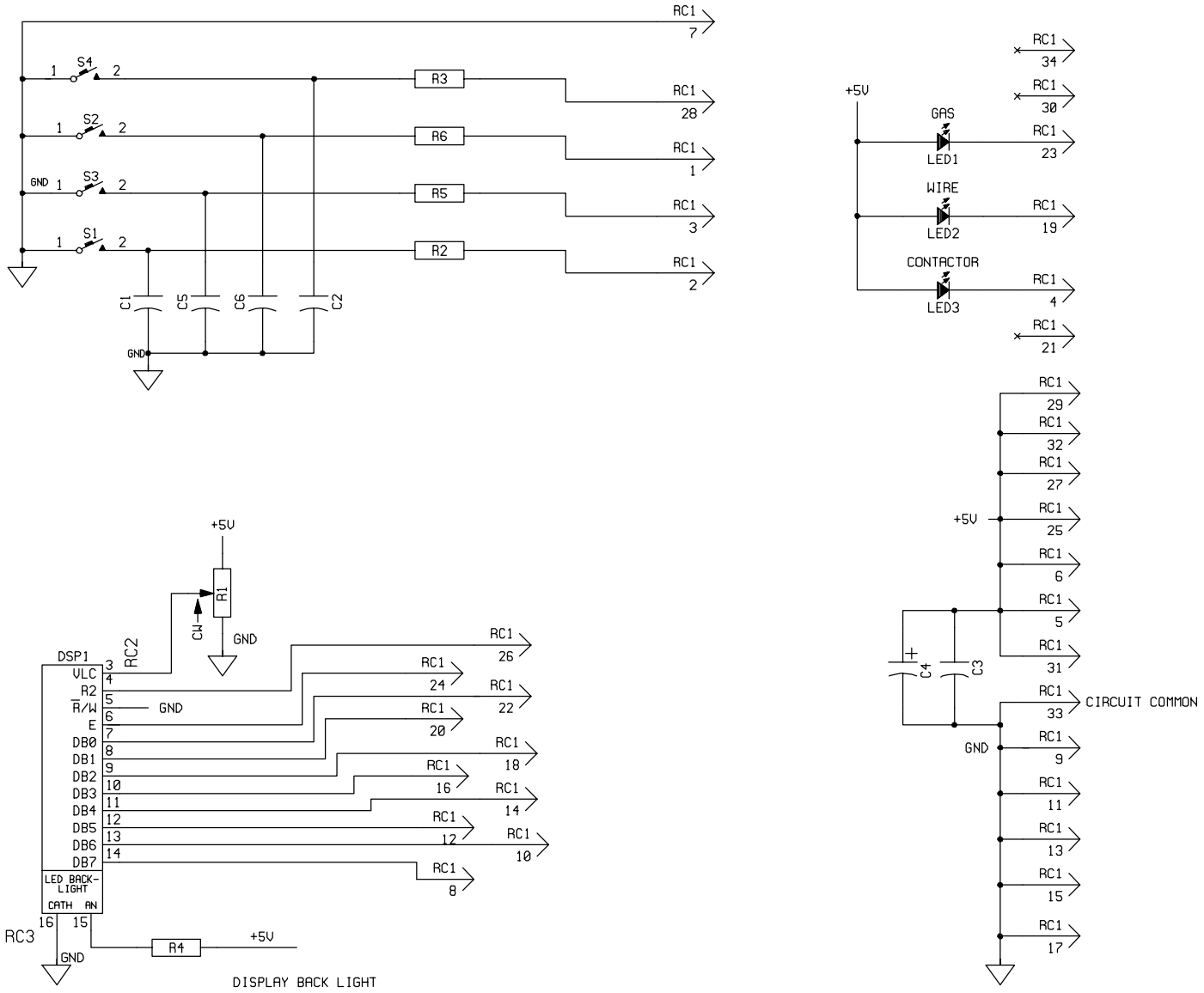


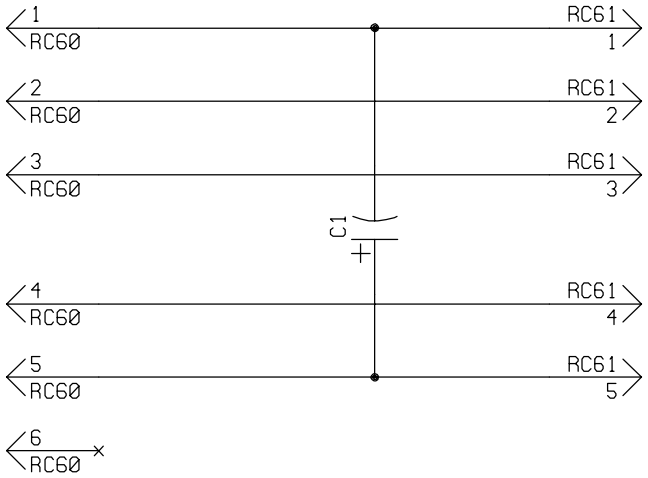
Figure 13-7. Circuit Diagram For Filter Board PC6



POWER AND GROUND	
DISPL1	1=GND,2=+5V

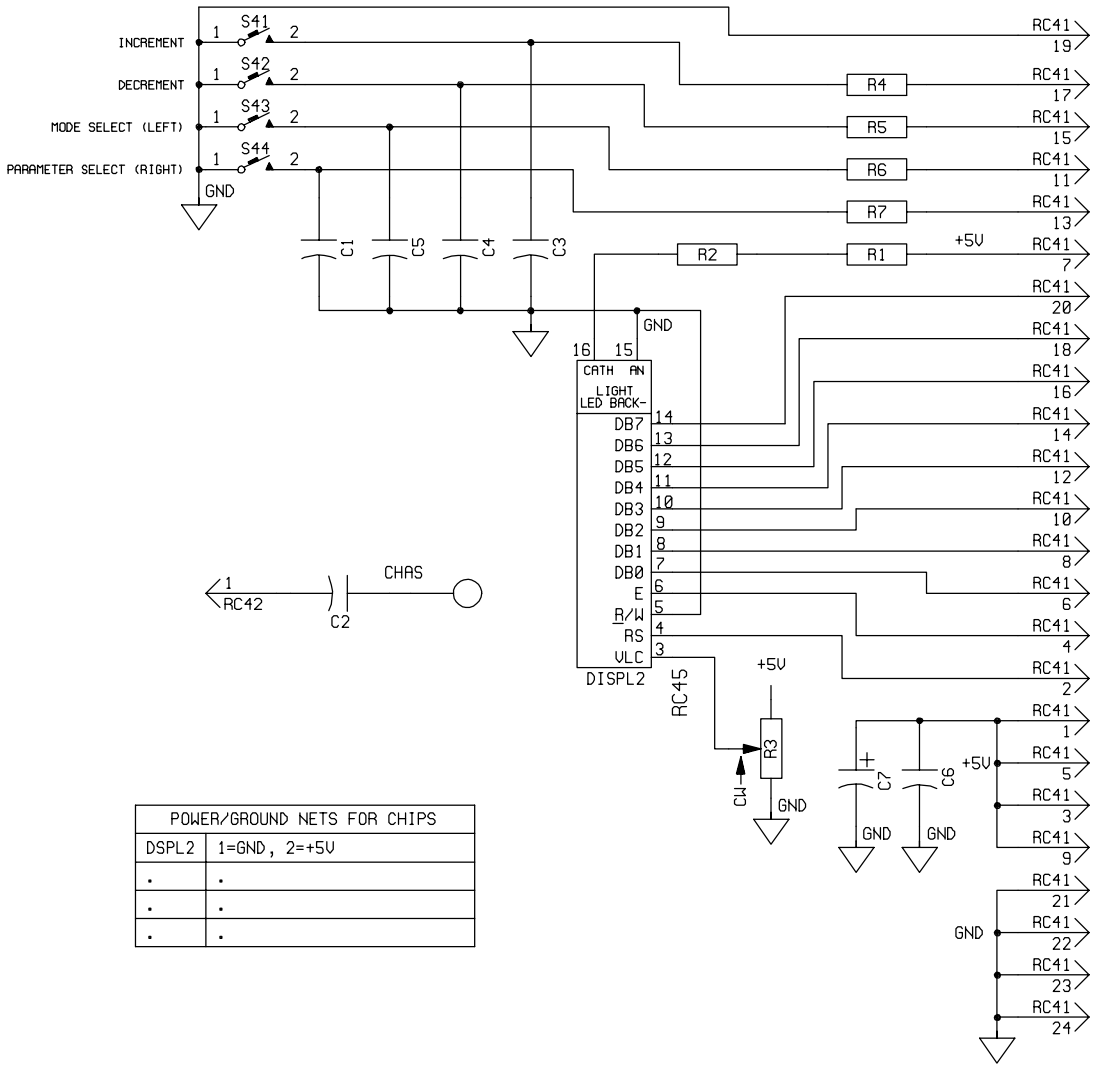
SC-165 462-A

Figure 13-8. Circuit Diagram For Display Board PC7



SA-156 626-A

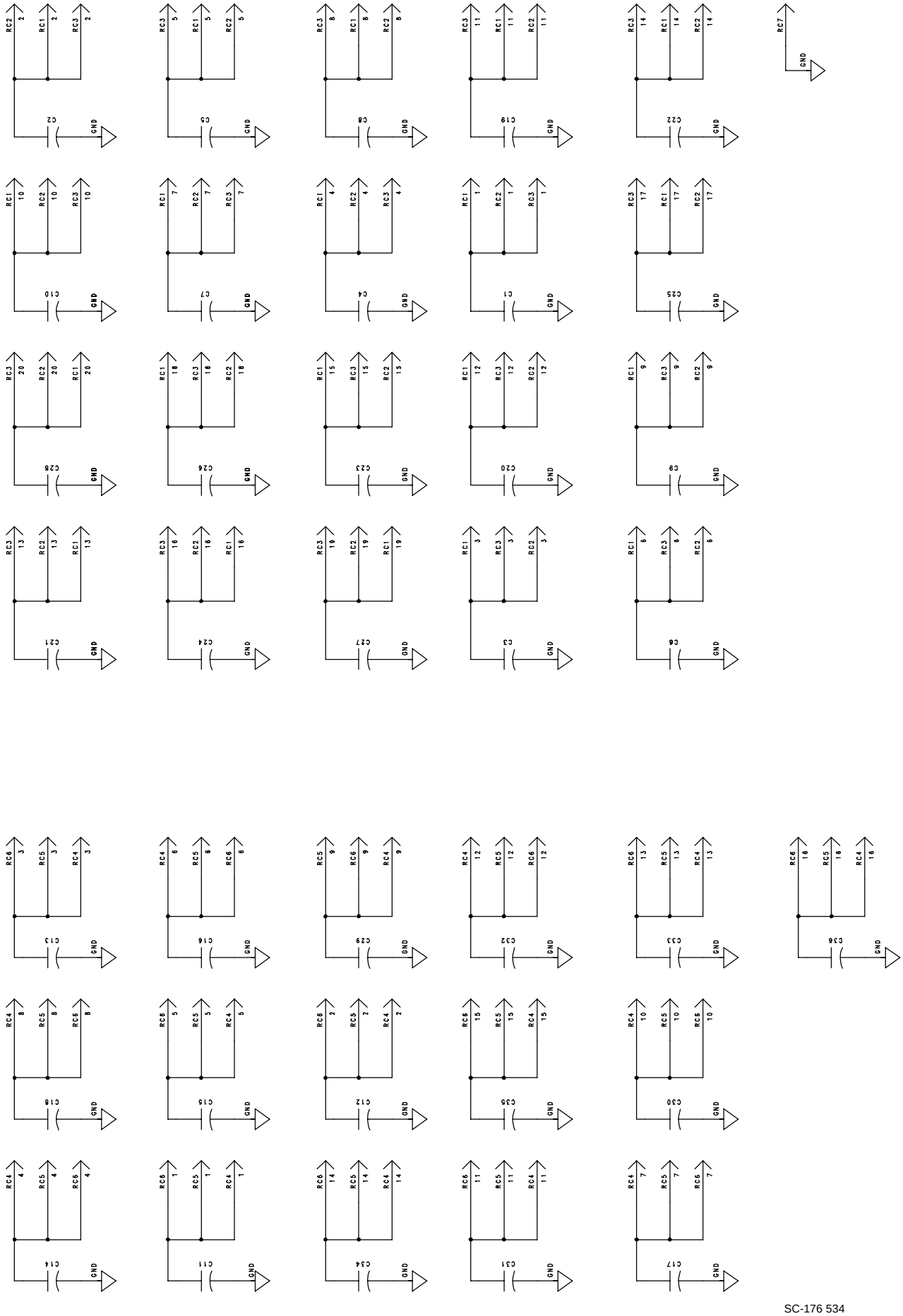
Figure 13-9. Circuit Diagram For Data Card Board PC8



POWER/GROUND NETS FOR CHIPS	
DSPL2	1=GND, 2=+5V
.	.
.	.
.	.

SA-158 163

Figure 13-10. Circuit Diagram For Pulse Display Board PC9


RC2 2 RC1 2 RC3 2 C2 GND
RC3 5 RC1 5 RC2 5 C5 GND
RC3 8 RC1 8 RC2 8 C8 GND
RC3 11 RC1 11 RC2 11 C19 GND
RC3 14 RC1 14 RC2 14 C22 GND
RC7 GND
RC1 10 RC2 10 RC3 10 C10 GND
RC1 7 RC2 7 RC3 7 C7 GND
RC1 4 RC2 4 RC3 4 C4 GND
RC1 1 RC2 1 RC3 1 C1 GND
RC3 17 RC1 17 RC2 17 C25 GND
RC3 20 RC2 20 RC1 20 C28 GND
RC1 18 RC3 18 RC2 18 C26 GND
RC1 15 RC3 15 RC2 15 C23 GND
RC1 12 RC3 12 RC2 12 C20 GND
RC1 9 RC3 9 RC2 9 C9 GND
RC3 13 RC2 13 RC1 13 C21 GND
RC3 16 RC2 16 RC1 16 C24 GND
RC3 19 RC2 19 RC1 19 C27 GND
RC1 3 RC3 3 RC2 3 C3 GND
RC1 6 RC3 6 RC2 6 C6 GND
RC6 3 RC5 3 RC4 3 C13 GND
RC4 6 RC5 6 RC6 6 C16 GND
RC5 9 RC6 9 RC4 9 C29 GND
RC4 12 RC5 12 RC6 12 C32 GND
RC6 13 RC5 13 RC4 13 C33 GND
RC6 16 RC5 16 RC4 16 C36 GND
RC4 8 RC5 8 RC6 8 C18 GND
RC6 5 RC5 5 RC4 5 C15 GND
RC6 2 RC5 2 RC4 2 C12 GND
RC6 15 RC5 15 RC4 15 C35 GND
RC4 10 RC5 10 RC6 10 C30 GND
RC4 4 RC5 4 RC6 4 C14 GND
RC6 1 RC5 1 RC4 1 C11 GND
RC6 14 RC5 14 RC4 14 C34 GND
RC6 11 RC5 11 RC4 11 C31 GND
RC4 7 RC5 7 RC6 7 C17 GND

SC-176 534

Figure 13-11. Circuit Diagram For Junction Board PC10

☞ *Hardware is common and not available unless listed.*

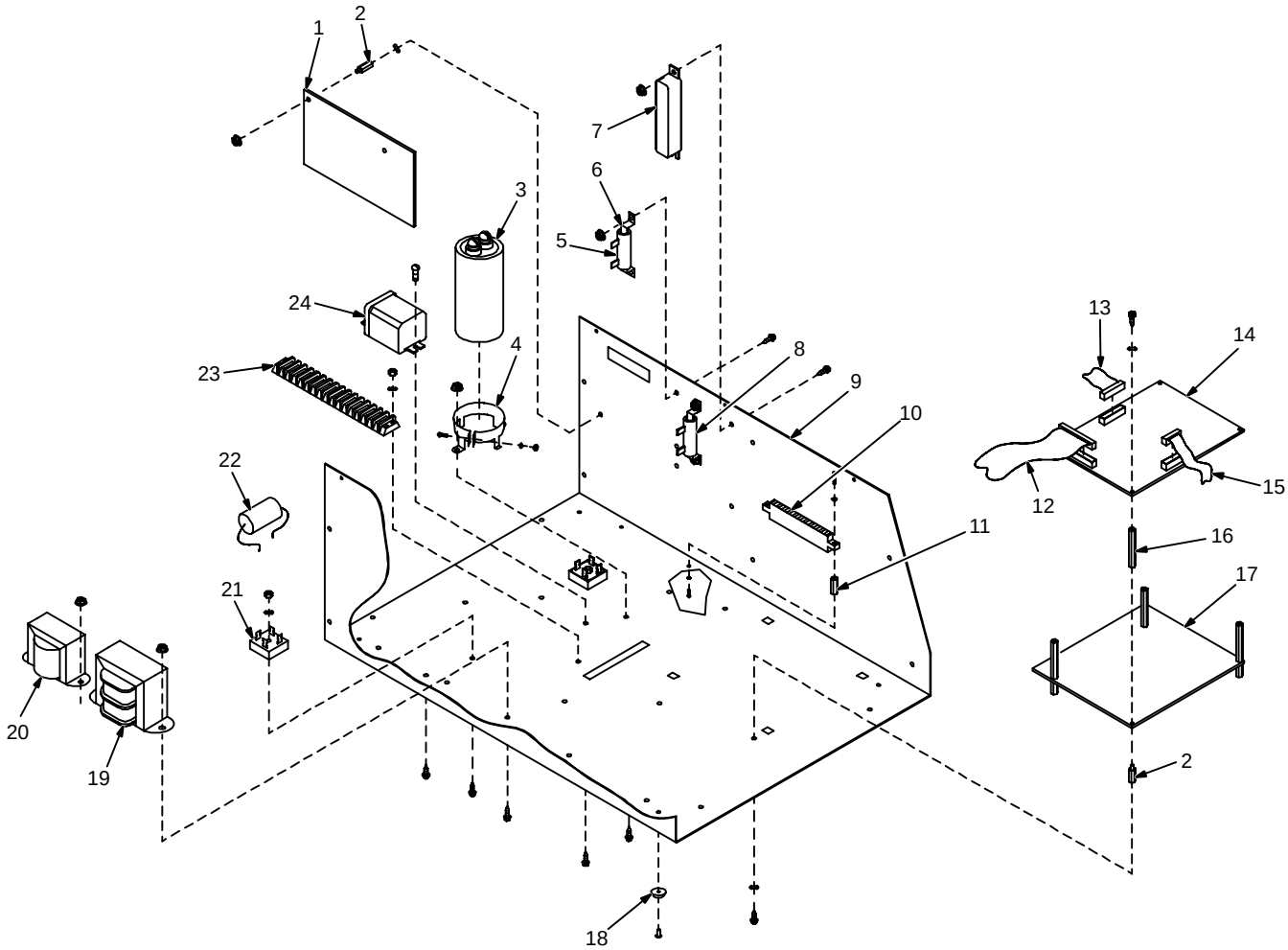


Figure 14-1. Case Section w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 14-1. Case Section w/Components

1	PC3	071 642	CIRCUIT CARD ASSEMBLY, motor speed control	1
2		098 691	STAND-OFF, No. 6-32 x .500 lg	10
3	C1	031 692	CAPACITOR, elctlt 750uf 200VDC	1
4		006 426	CLAMP, capacitor 2.000dia	1
5	R3	079 497	RESISTOR, WW fxd 25W 2K ohm	1
6		605 741	CLIP, mtg resistor	4
7	R2	030 941	RESISTOR, WW fxd 100W 5 ohm	1
8	R1	030 651	RESISTOR, WW fxd 25W 10 ohm	1
9		166 357	CASE SECTION, bottom/sides	1
		+166 512	COVER, top	1
		134 327	LABEL, warning general precautionary	1
10	PLG7	165 897	CONNECTOR & SOCKETS, (consisting of)	1
		111 030	CONNECTOR, edge skt 20-18ga	22
11		009 335	STAND-OFF, No. 4-40 x .625 lg	2
12		155 022	CABLE, ribbon 34posn 12.000 in	1
13		169 923	CABLE, ribbon 24posn 14.000 in	1
14	PC1	171 525	CIRCUIT CARD ASSEMBLY, processor w/prom	1
	PLG11	115 092	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	8
	PLG13	163 467	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	9
	PLG15	153 501	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	6
	PLG17	115 093	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	6
	PLG18	162 382	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	20
15		155 629	CABLE, ribbon 14posn 3.000 in	1
16		126 689	STAND-OFF, No. 6-32 x 1.500 lg	4
17	PC5	165 463	CIRCUIT CARD ASSEMBLY, I/O interface	1
	PLG51	158 720	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	12
	PLG52,58	158 719	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	2
	PLG53	131 204	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	3
	PLG54	148 439	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	10
	PLG55	115 092	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	8
	PLG56	115 093	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	6
	PLG57	164 900	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	3
18		019 663	MOUNT, nprn 15/16 OD x 3/8rec 3/16 x 3/8	4
19	T2	090 465	XFMR, signal 115V 24VCT 4A	1
20	T1	169 063	XFMR, control	1
21	SR1,SR2	035 704	RECTIFIER, integ 40A 800V	2
22	C2	169 080	CAPACITOR	1
23	1T	157 169	BLOCK, term 20A 16 pole	1
		601 219	LINK, jumper term blk 20A	3
24	CR1	109 006	RELAY, encl 24VAC DPDT	1
	D1	171 386	DIODE, w/leads	1
	PC10	176 536	CIRCUIT CARD ASSEMBLY, junction	1
	PLG6	163 467	CONNECTOR & SOCKETS	1
	PLG166	131 052	CONNECTOR & SOCKETS	1
	C3	179 217	CAPACITOR	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 14-2. Panel, Front w/Components

1	DSPL1	165 459	CIRCUIT CARD ASSEMBLY, display	1
2		166 355	PANEL, front	1
		057 359	BLANK, snap-in nyl .375mtg hole	1
3		164 757	GASKET, meter lens	1
4		169 419	COVER, troubleshooting lights	1
5		154 109	PLATE, ident inner control	1
6		155 024	LENS, clear anti glare	2
7		168 337	PANEL, control inner	1
8	PC8	156 623	CIRCUIT CARD ASSEMBLY, data card	1
	PLG60	153 501	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	6
9	DSPL2	158 160	CIRCUIT CARD ASSEMBLY, side display	1
10		144 844	STAND-OFF, No. 6-32 x .875 lg	8
11			NAMEPLATE, (order by model and serial No.)	1
12		168 459	DOOR, access	1
13		089 899	LATCH, slide	1
14		153 169	ACTUATOR, switch	8
15		089 032	LENS, LED 4341 red	3

☞ *Hardware is common and not available unless listed.*

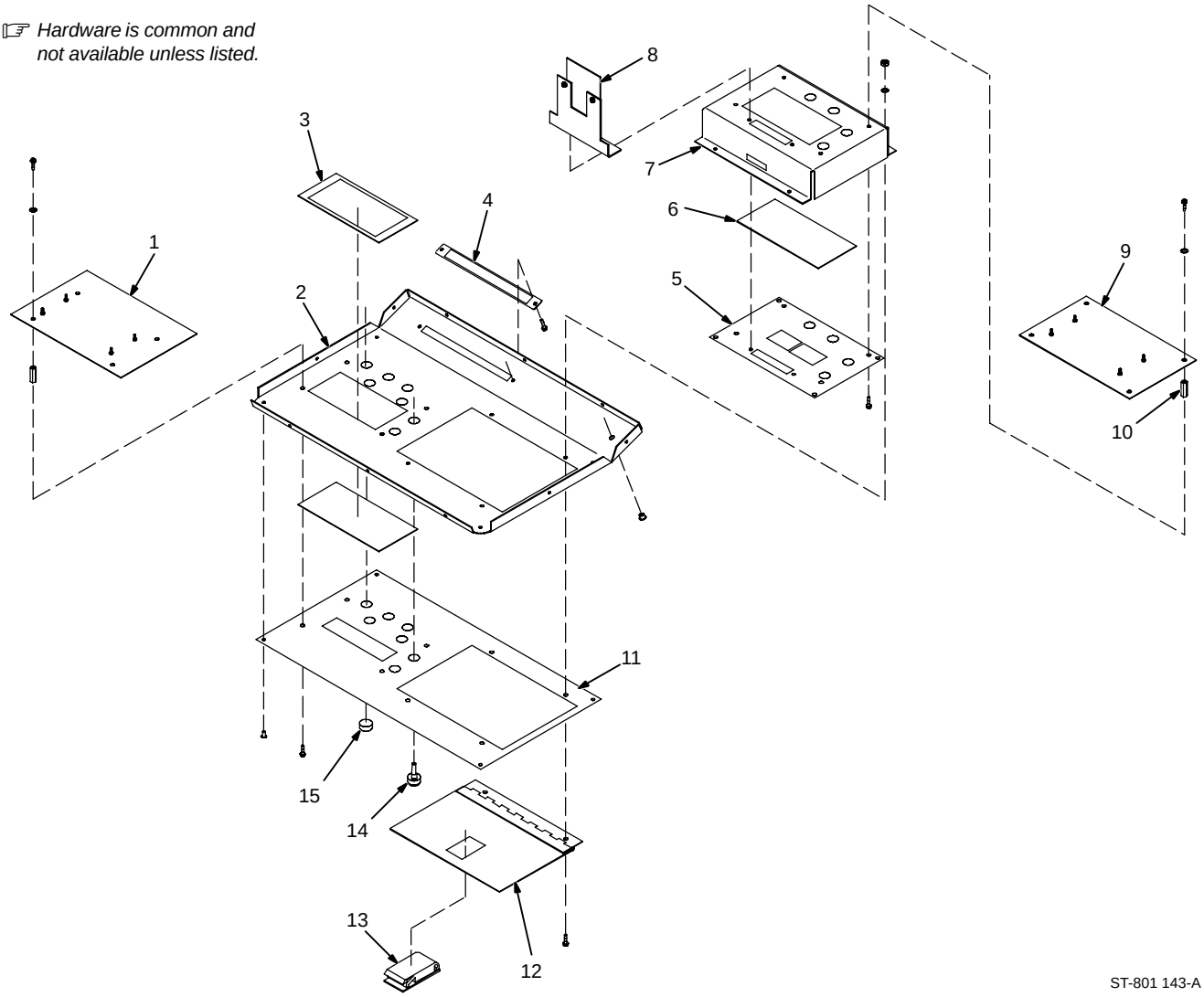


Figure 14-2. Panel, Front w/Components

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 14-3. Panel, Center w/Components

1		099 037	EDGE TRIM, style 62-1/16 black w/clips (order by ft)	2ft
2	2T	157 169	BLOCK, term 20A 16 pole	1
3		038 839	BLOCK, term 20A 5 pole	1
		601 219	LINK, jumper term blk 20A	2
4	CR2	052 964	RELAY, encl 24VDC DPDT	1
5		134 201	STAND-OFF SUPPORT, pc card	4
6		166 354	PANEL, mtg cmpts	1
7	PC4	180 189	CIRCUIT CARD ASSEMBLY, interface (consisting of)	1
		012 633	FUSE, mintr gl 1A 250V	1
	PLG3	158 768	CONNECTOR, rect 24P/S 2 row plug	1
		113 746	CONNECTOR, rect skt 24-18ga	24
	PLG6	164 467	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	9
	PLG70	115 092	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	8

☞ *Hardware is common and not available unless listed.*

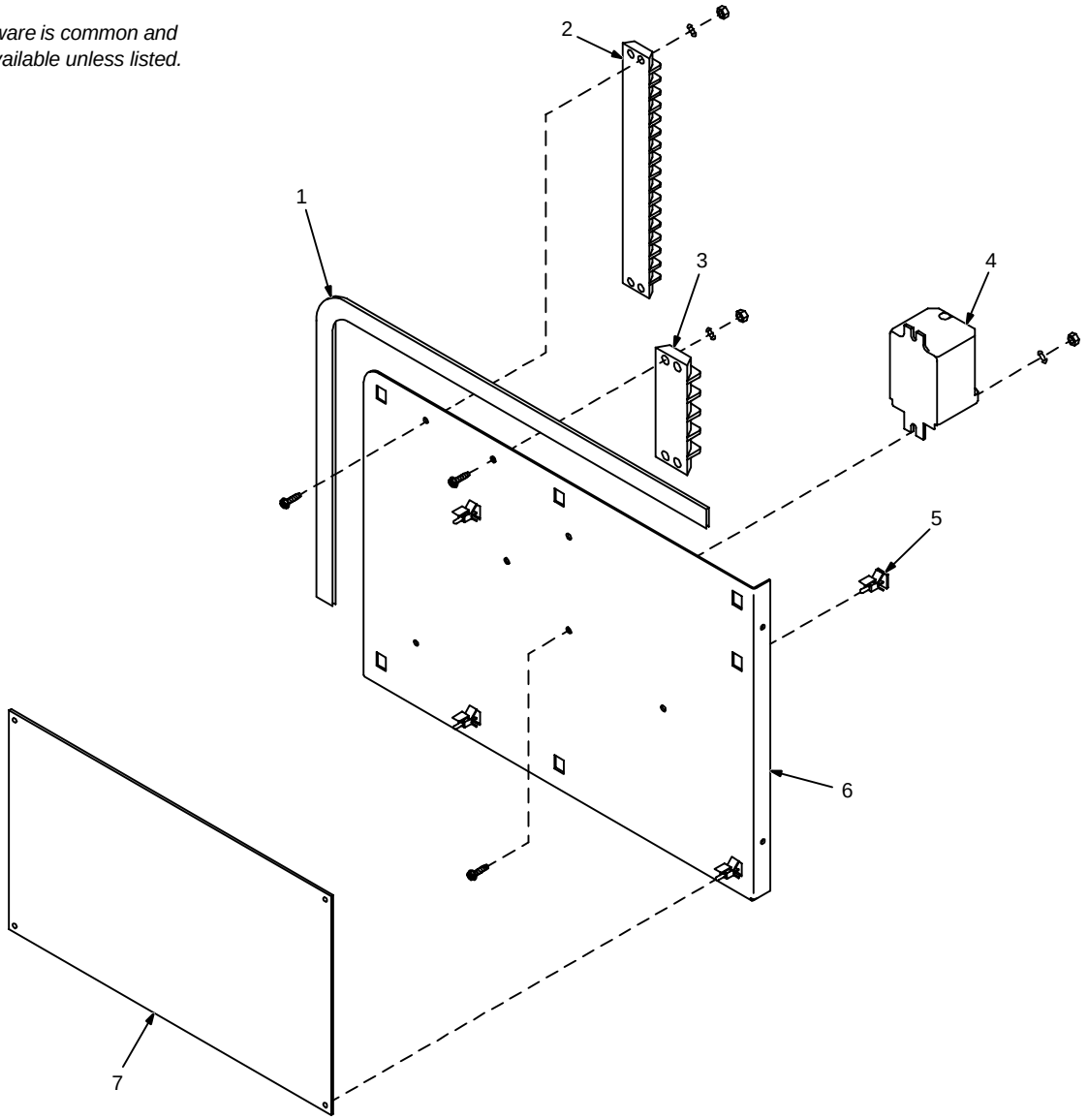


Figure 14-3. Panel, Center w/Components

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

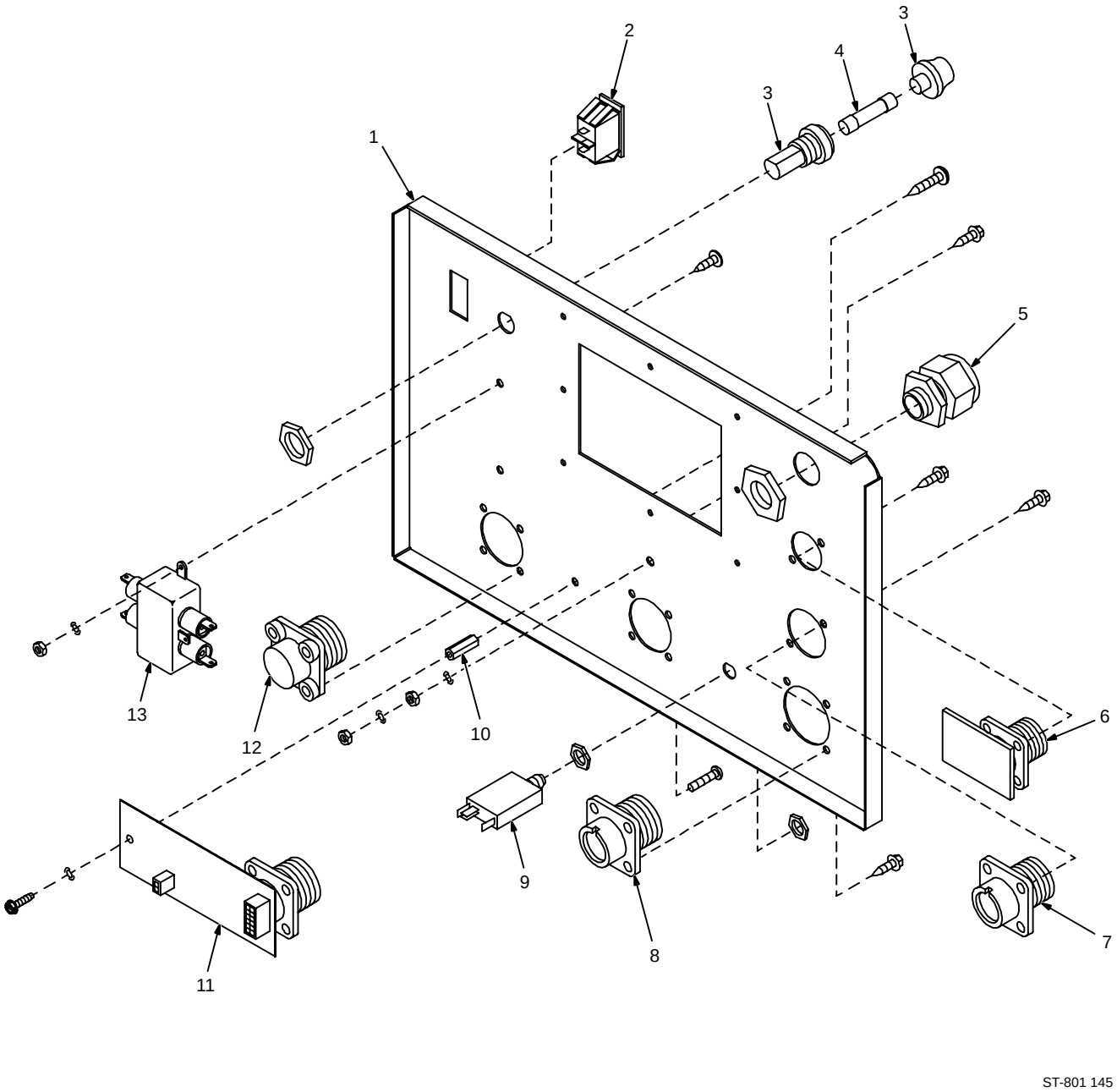


Figure 14-4. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 14-4. Panel, Rear w/Components

1		171 363	PANEL, rear	1
2	S1	111 997	SWITCH, rocker spst 10A 250VAC	1
3		046 432	HOLDER, fuse mintr .250 x 1.250 panel mtg	1
4	F1	012 655	FUSE, mintr cer 10A 250V	1
5		139 042	BUSHING, strain relief .270/.480 ID	1
6		171 367	RECEPTACLE, w/components (consisting of)	1
	PC2	134 560	CIRCUIT CARD, filter	1
	R4	074 110	RESISTOR, c 1W 10K ohm	1
	RC21	076 624	CONNECTOR, circ 4 pin rcpt	1
7	RC9	152 492	CONNECTOR & PINS, (consisting of)	1
		134 731	CONNECTOR, circ pin 14-18ga	4
8	RC8	153 884	CONNECTOR, circ 19skt rcpt	1
9	CB1	011 991	CIRCUIT BREAKER, man reset 1P 1.5A 250VAC	1
10		073 756	STAND-OFF, No. 6-32 x .625 lg	1
11	PC6	179 741	CIRCUIT CARD ASSEMBLY, filter	1
	PLG89	131 204	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	3
	PLG82	158 720	CONNECTOR & SOCKETS, (consisting of)	1
		147 995	CONNECTOR, rect skt 22-18ga	12
12	RC20	139 268	CONNECTOR, circ 10skt rcpt	1
13	FL1	084 171	FILTER, line pwr 115/250V	1
		176 872	CABLE, motor/gas (consisting of)	1
		153 886	CONNECTOR, circ 19 pin plug	1
		039 734	CONNECTOR, circ clamp str rlf	1
		600 798	CABLE, port No. 16 10/c (order by ft)	30ft
		071 892	CONNECTOR & SOCKETS, (consisting of)	1
		079 534	CONNECTOR, circ skt 14-18ga	14
		079 739	CONNECTOR, circ clamp str rlf	1
		158 373	CABLE, interconnecting power 10ft (consisting of)	1
		097 868	CONNECTOR, circ 17skt plug	1
		116 964	CONNECTOR, circ clamp str rlf	2
		600 343	CABLE, port No. 16 5/c (order by ft)	10ft
		097 866	CONNECTOR, circ 17 pin plug	1
		175 115	CABLE, interconnecting 10ft (consisting of)	1
		141 162	CONNECTOR & PINS, (consisting of)	1
		134 731	CONNECTOR, circ pin 14-18ga	14
		079 739	CONNECTOR, circ clamp str rlf	1
		121 274	CABLE, port No. 18 12/c (order by ft)	10ft
		152 370	CONNECTOR & SOCKETS, (consisting of)	1
		079 534	CONNECTOR, circ skt 14-18ga	14
		079 739	CONNECTOR, circ clamp str rlf	1
		133 866	CABLE, volt sense 35ft (consisting of)	1
		073 686	CONNECTOR, circ 4skt plug	1
		039 828	CONNECTOR, circ clamp str rlf	1
		133 859	CABLE, shld No. 18ga 1/c (order by ft)	70ft
	PLG150	131 054	CONNECTOR & SOCKETS, (consisting of)	1
		113 746	CONNECTOR, rect skt 24-18ga	2
	CR3	178 503	SWITCH, reed	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

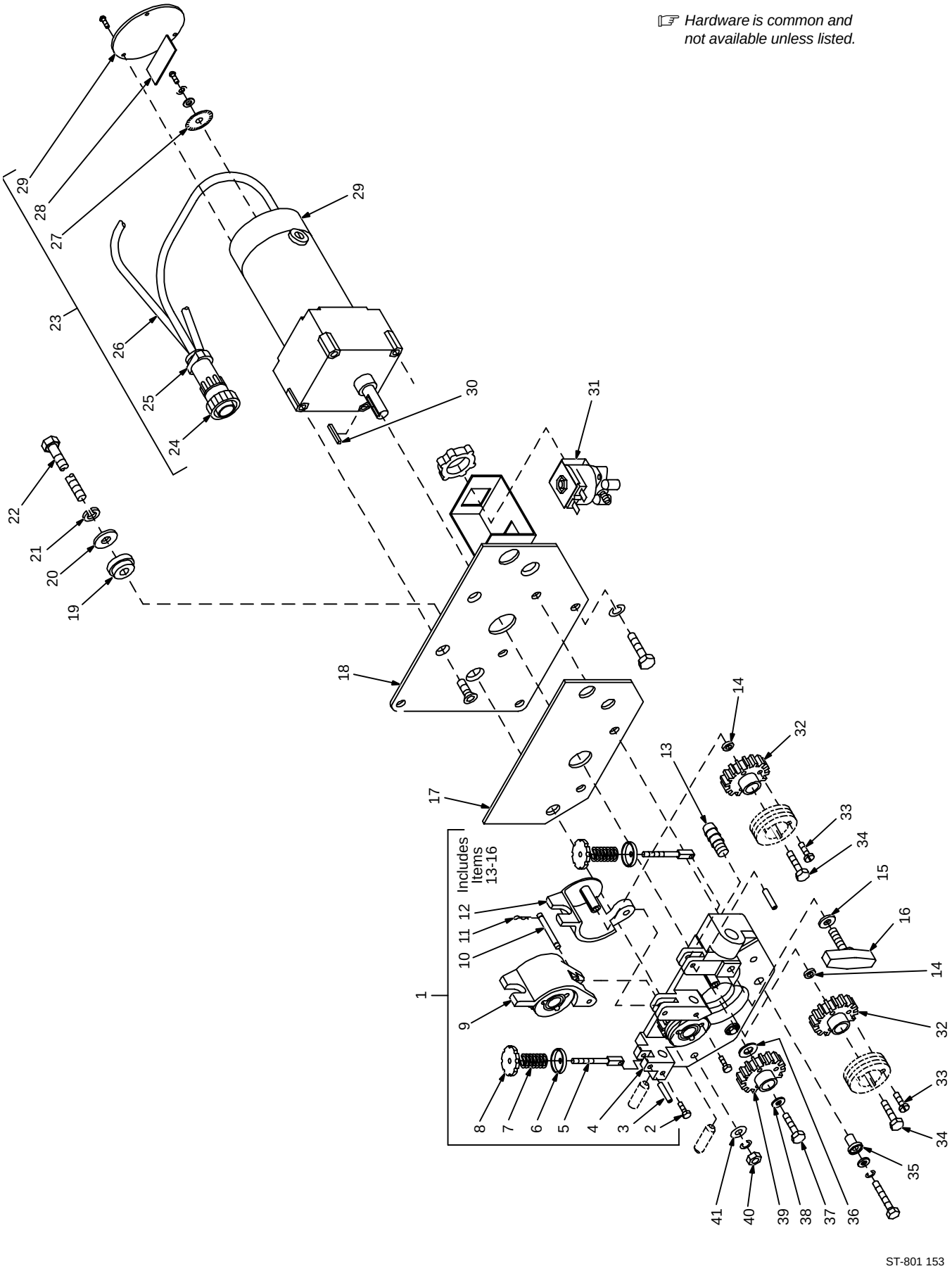


Figure 14-5. Motor & Drive Assembly

Item No.	Part No.	Description	Quantity

Figure 14-5. Motor & Drive Assembly

1	046 779	DRIVE ASSEMBLY, wire (consisting of)	1
2	602 154	SCREW, cap stl hexhd .250-20 x .500	2
3	010 224	PIN, spring CS .187 x 1.000	2
4	166 337	HOUSING, adapter gun/feeder	1
5	085 242	FASTENER, pinned	2
6	085 244	WASHER, cupped stl .328 ID x .812 OD x .125 lip	2
7	010 231	SPRING, cprsn .770 OD x .105 wire x 1.225	2
8	085 243	KNOB, adjustment tension	2
9	166 071	LEVER, mtg pressure gear	1
10	079 634	PIN, hinge	1
11	151 828	PIN, cotter hair .054 x .750	1
12	166 338	LEVER, mtg pressure gear	1
13	144 172	FITTING, brs barbed M 3/16tbg x .250-20	1
14	166 072	SPACER, gear	1
15	604 538	WASHER, flat stl SAE .312	1
16	079 772	KNOB, plstc T 1.500 lg x .312-18 x 2.000 bar	1
17	070 397	INSULATION, motor	1
18	173 128	BRACKET, mtg motor/gas	1
19	075 150	WASHER, shldr nyl 1.000 OD x .375 ID	2
20	010 910	WASHER, flat stl SAE .375	2
21	602 213	WASHER, lock stl split .375	4
22	079 624	SCREW, cap stl hexhd slflkg .375-16 x 2.250	2
23	173 145	MOTOR, gear (consisting of)	1
24	047 636	CONNECTOR & PINS, (consisting of)	1
	079 535	CONNECTOR, circ pin push-in 14-18ga	14
25	079 739	CLAMP, cable strain relief sz 17	1
26	172 996	CABLE, motor 12.000 in	1
27	132 611	OPTICAL ENCODER	1
28	153 631	CIRCUIT CARD, digital tach	1
	131 203	CONNECTOR & PINS (consisting of)	1
	114 656	CONNECTOR, rect pin 24-18ga	3
29	+172 807	MOTOR, gear 1/8hp 115VDC 2000RPM (consisting of)	1
	153 491	KIT, brush replacement (consisting of)	1
	153 492	CAP, brush	2
	153 493	BRUSH CARBON	2
30	092 865	KEY, stl .1215/.1230 x .750	1
31	133 873	VALVE, 24VDC 2 way custom port	1
	605 227	NUT, .750-14 knurled	1
	134 834	HOSE, SAE .187 ID x .410 OD (order by ft)	1ft
	149 332	CLAMP, hose .405-.485clp dia	1
	604 525	CABLE, port No. 18 2/c (order by ft)	3ft
	026 202	DIODE, rect 1A 400V SP	1
32	053 842	GEAR, spur insulated w/bearing	4
33	079 626	SCREW, mach stl filh 10-32 x .875	12
34	605 518	SCREW, cap stl hexhd .250-20 x 1.250	4
35	072 010	WASHER, shldr nyl .437 OD x .316 ID x .187	2
36	079 625	WASHER, spring stl .500 shakeproof	2
37	000 418	SCREW, cap stl hexhd slflkg .250-20 x .500	1
38	602 241	WASHER, flat stl SAE .375	1
39	093 664	GEAR, spur insulated drive	1
40	601 872	NUT, stl hex full .375-16	2
41	602 243	WASHER, flat stl std .375	2
	168 589	BUSHING, insulating 1.500dia	1
	168 590	BUSHING, insulating .750dia	3
	080 438	BRACKET, ball clamp	1
	079 872	BRACKET, mtg pivot	1
	080 439	BRACKET, ball clamp	1
	045 767	BAR, mounting	1

*Recommended Spare Parts.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller
The Power of Blue.

TRUE BLUE® WARRANTY

Effective January 1, 2000
(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Training (Schools, Videos, Books)
	Technical Manuals (Servicing Information and Parts)
	Circuit Diagrams
	Welding Process Handbooks
Contact the Delivering Carrier for:	File a claim for loss or damage during shipment.
For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	

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www.MillerWelds.com

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